

K.B COLLEGE OF ARTS AND COMMERCE FOR WOMEN

CERTIFICATE

This is to certify that the work entered in this Journal is the work of Principles of Geographic Information Systems by

Shri/Kumari _____

Of _____ Roll no _____

has satisfactorily completed the required number of practical and worked for the 5th term of the year 2022-2023 in the college laboratory as laid down by the University.

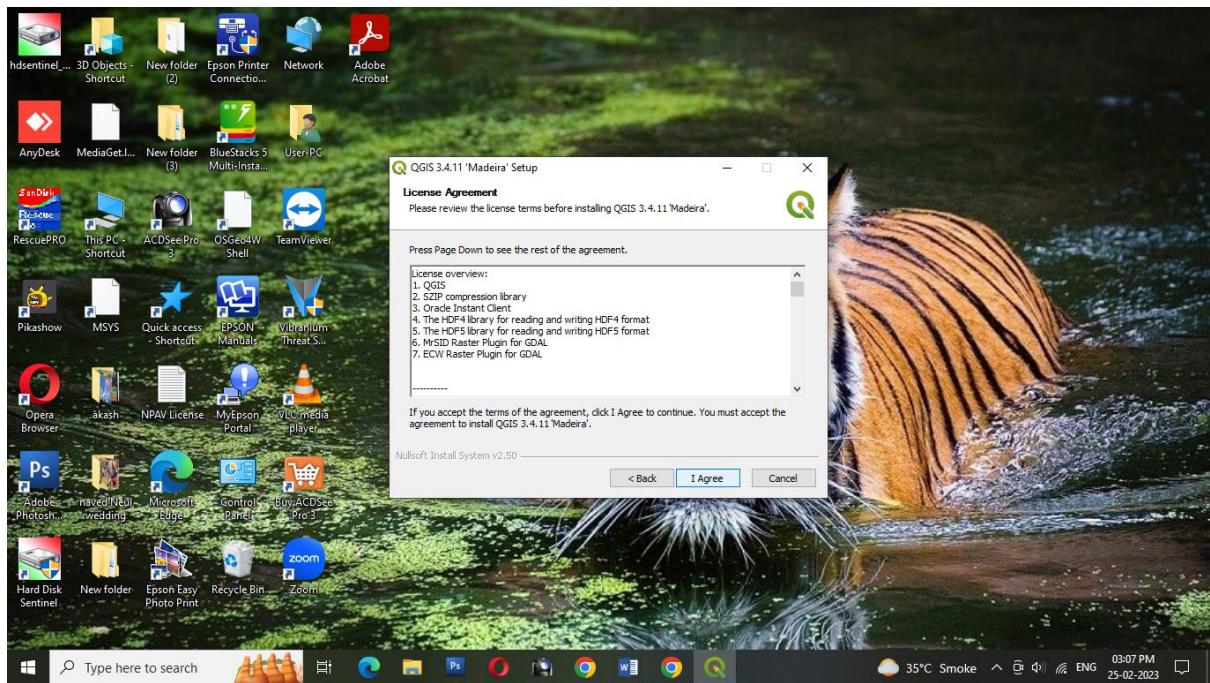
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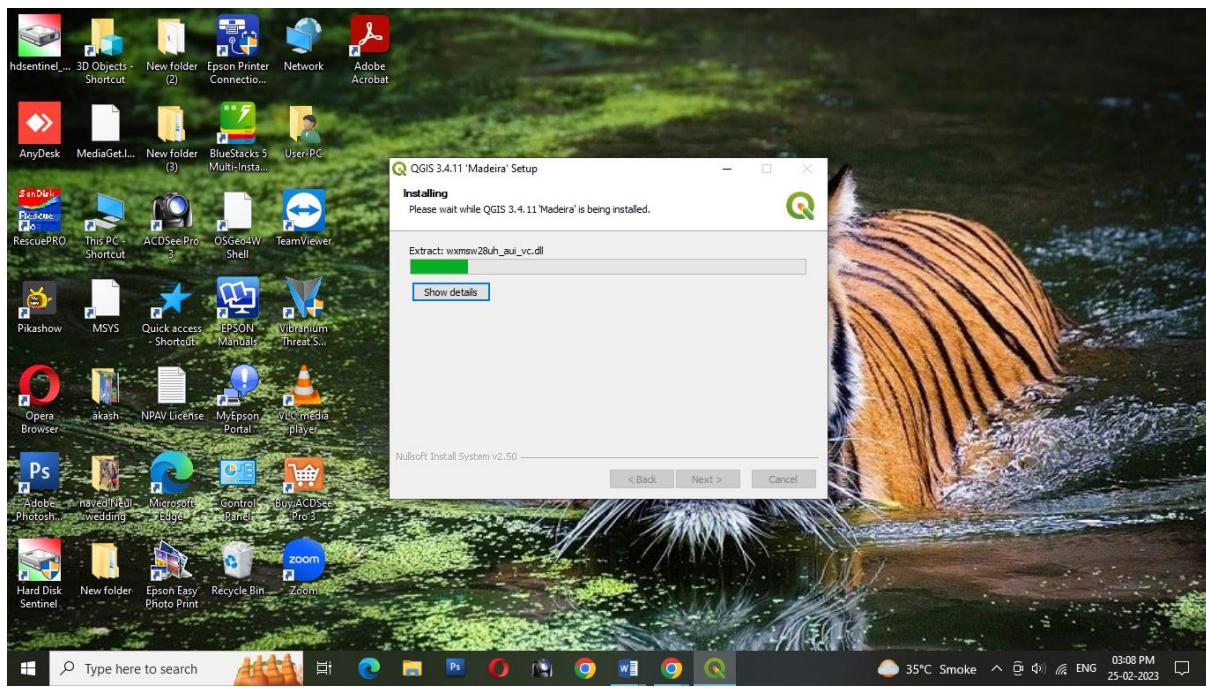
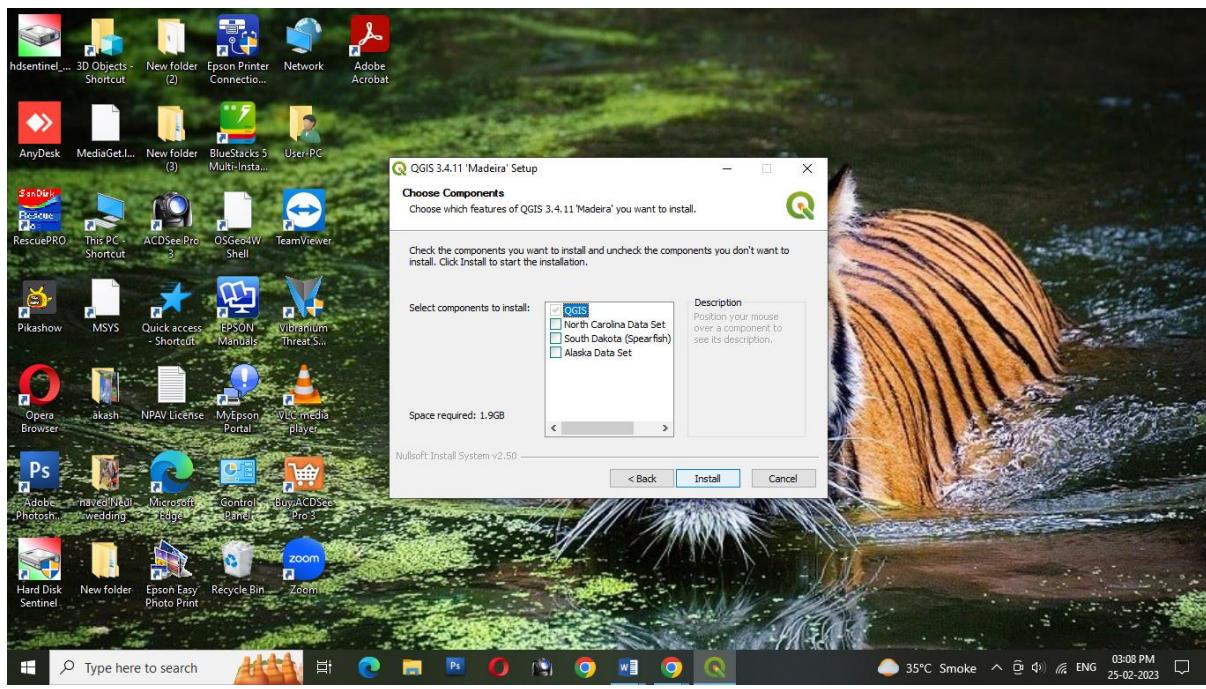
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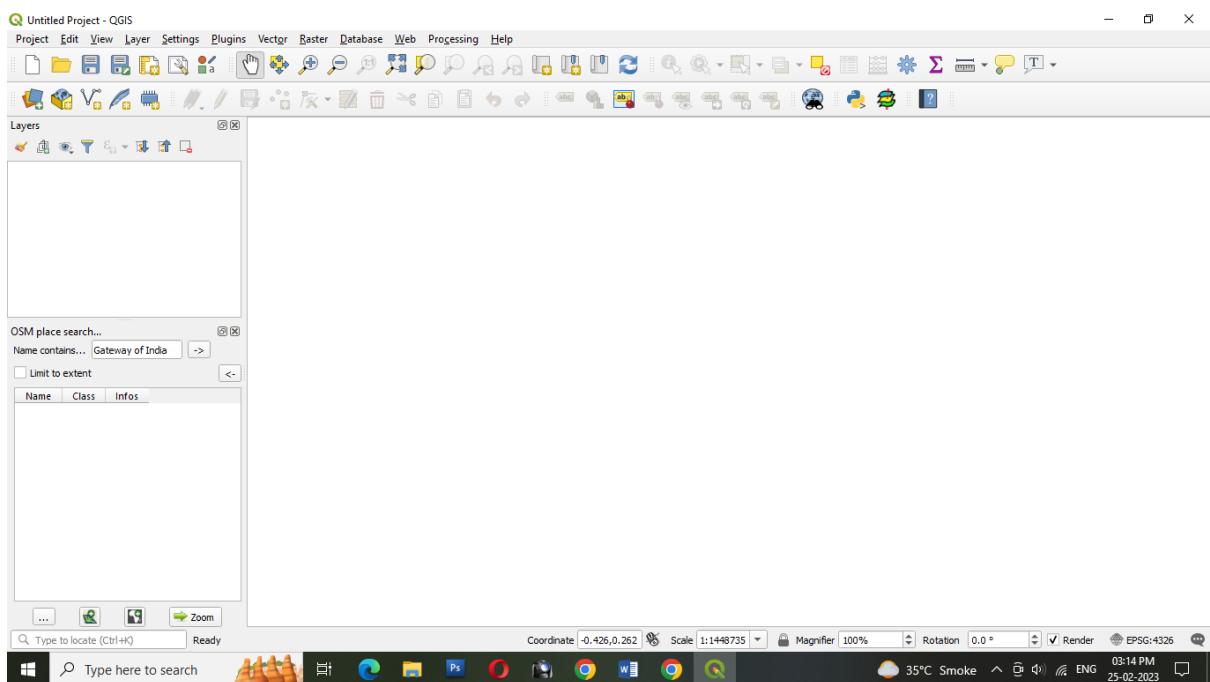
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Install qgis





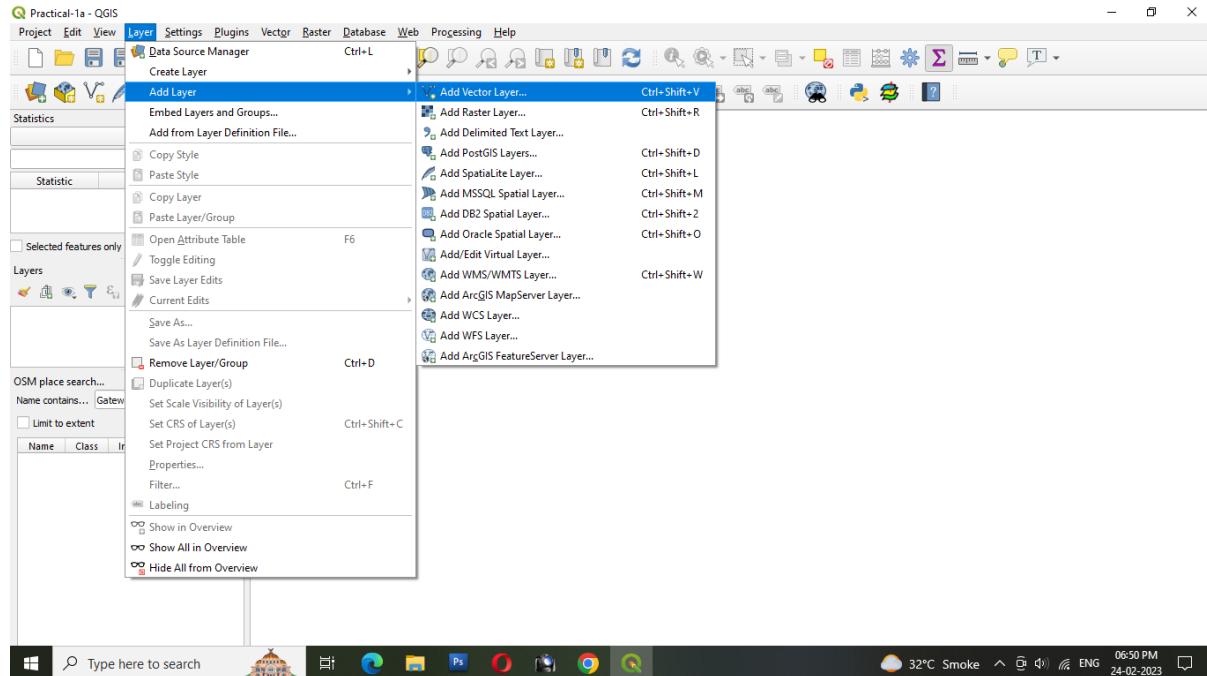


Practical-1 CREATING AND MANAGING VECTOR DATA

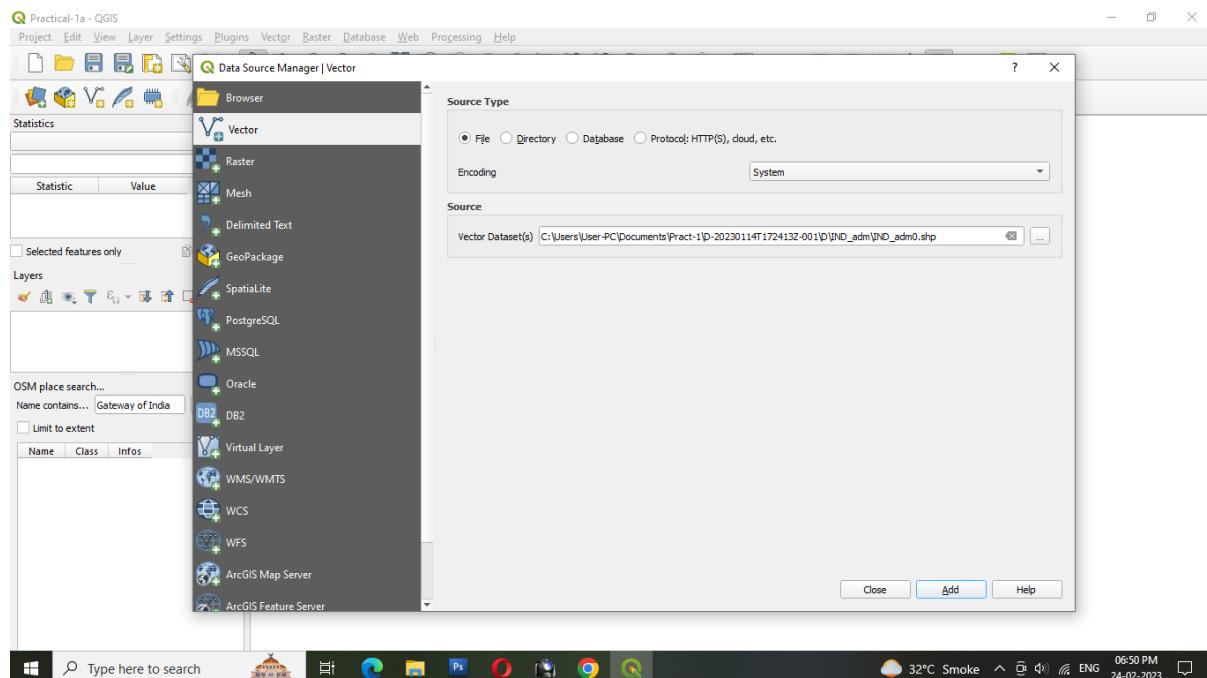
1(A) Adding vector layers

Step-1: Select Layers Tab.

Step-2: Select Add Layer from the list.



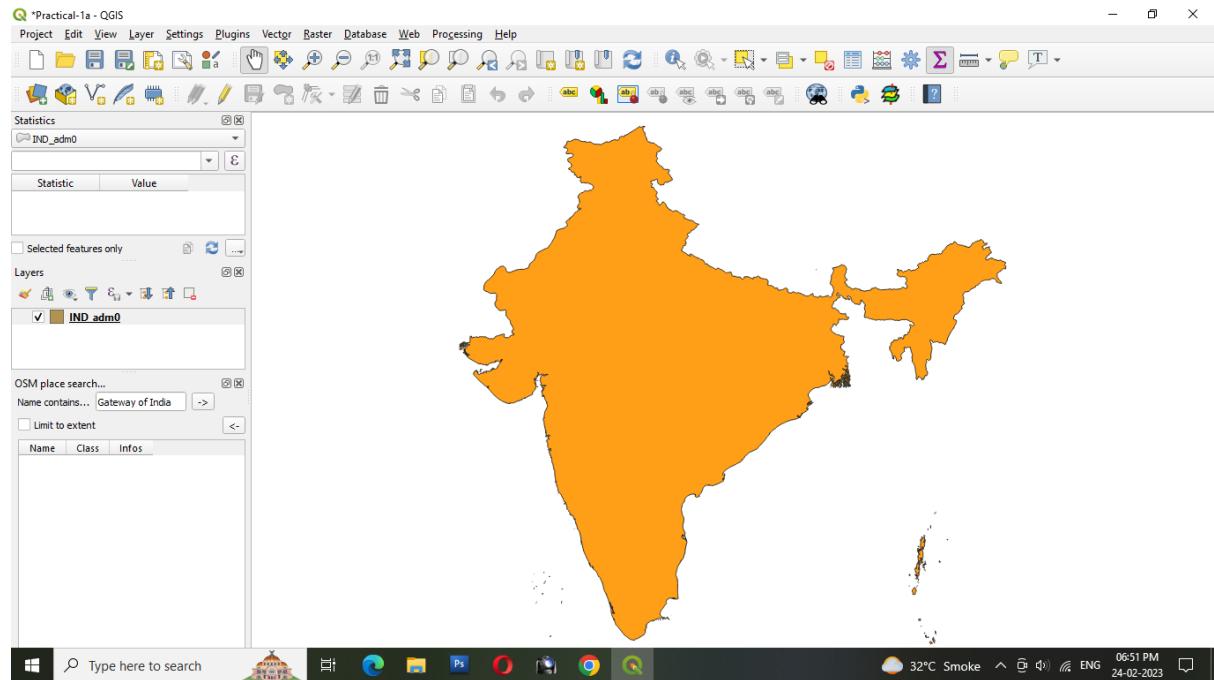
Step-3: Then select the below path (You can select your own path wherever files are stored).



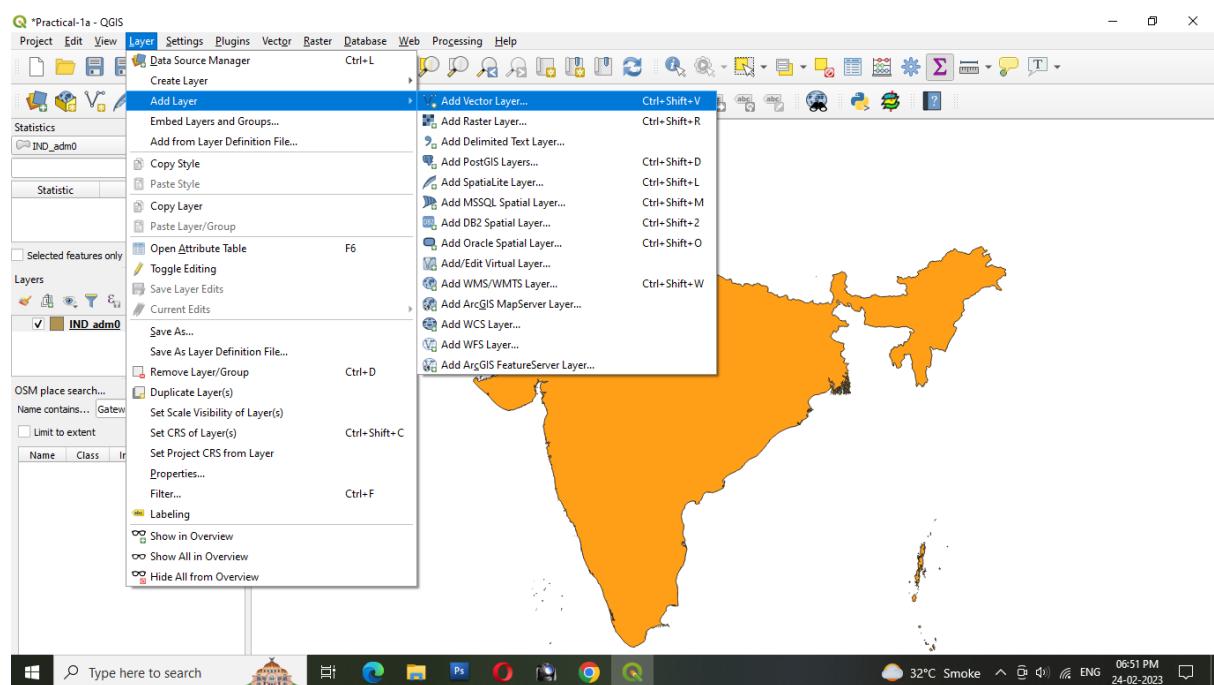
Step 4: Add selected shape file to the project.

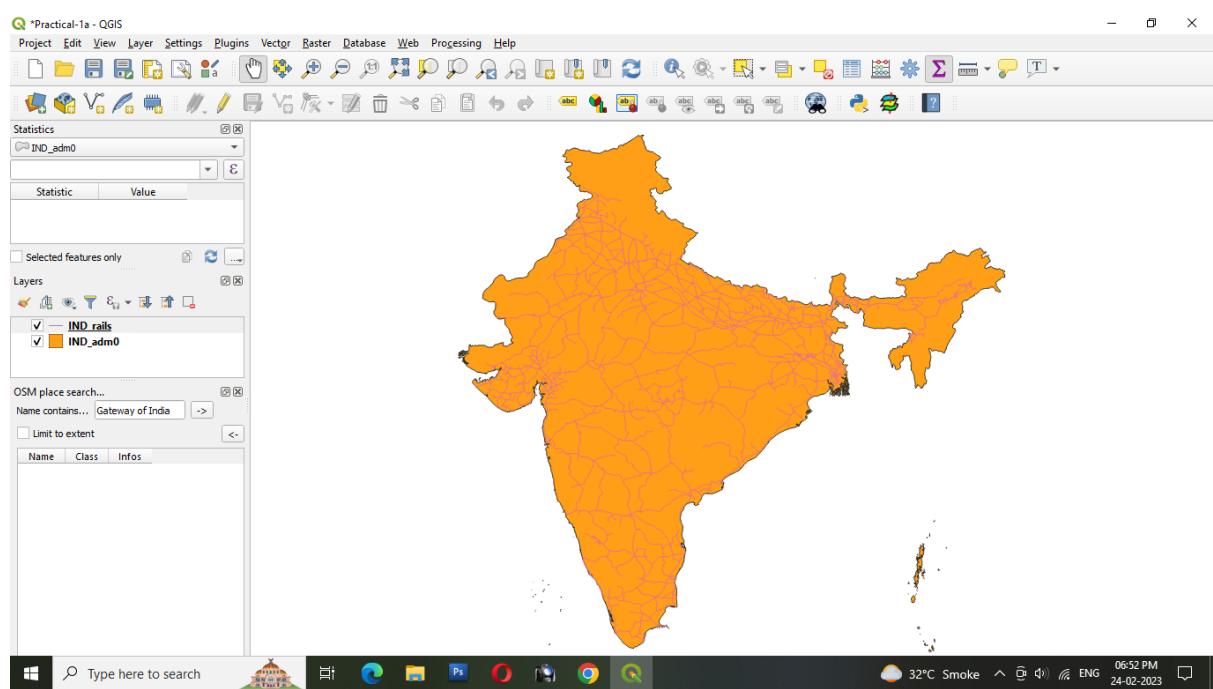
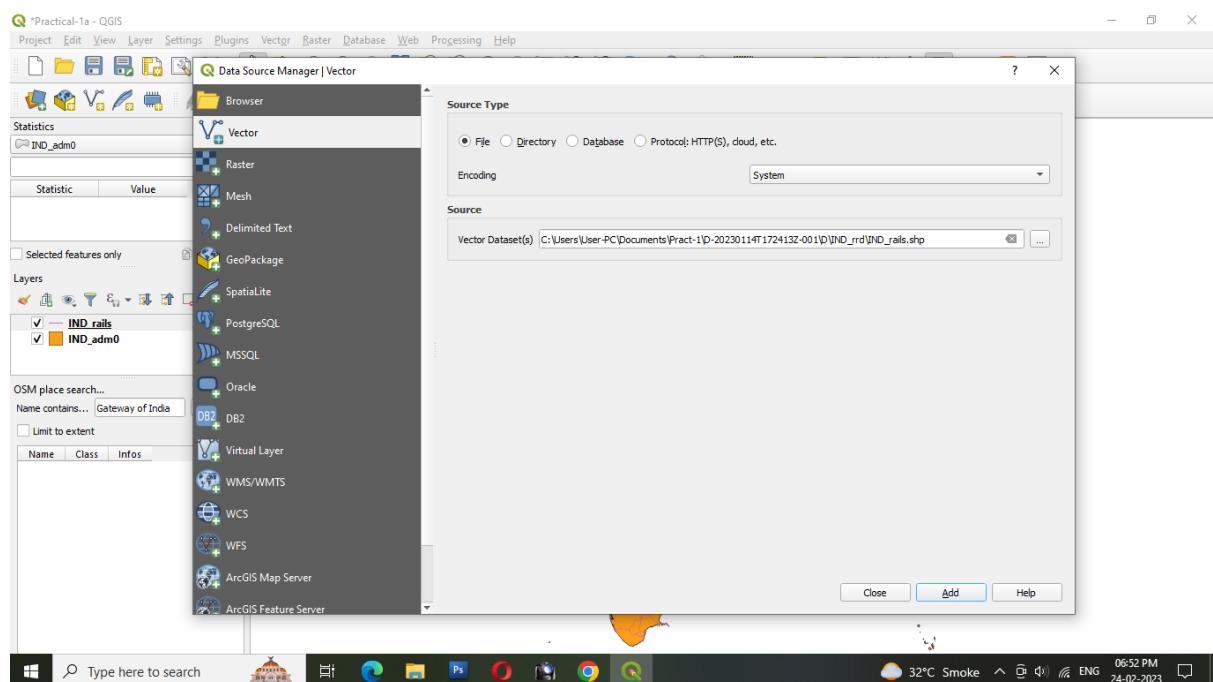
Step 5: Select layer from layer pane and open attribute table.

Step 6: Right click on layer and select Filter -> set the condition
“EXS_DESCRI”=’Unexamined/Unsurveyed’ and then press OK button.

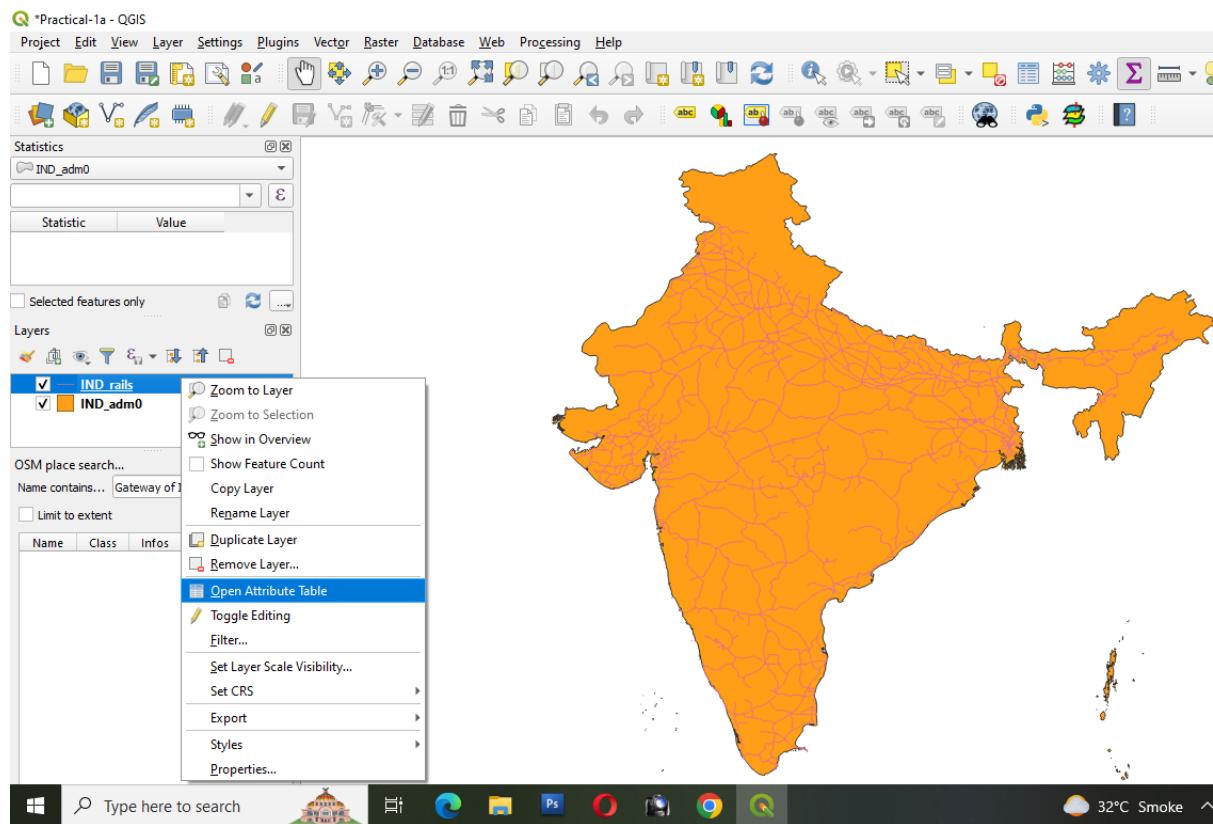


Step 7: Go to project -> properties -> Select CRS -> select WGS 84

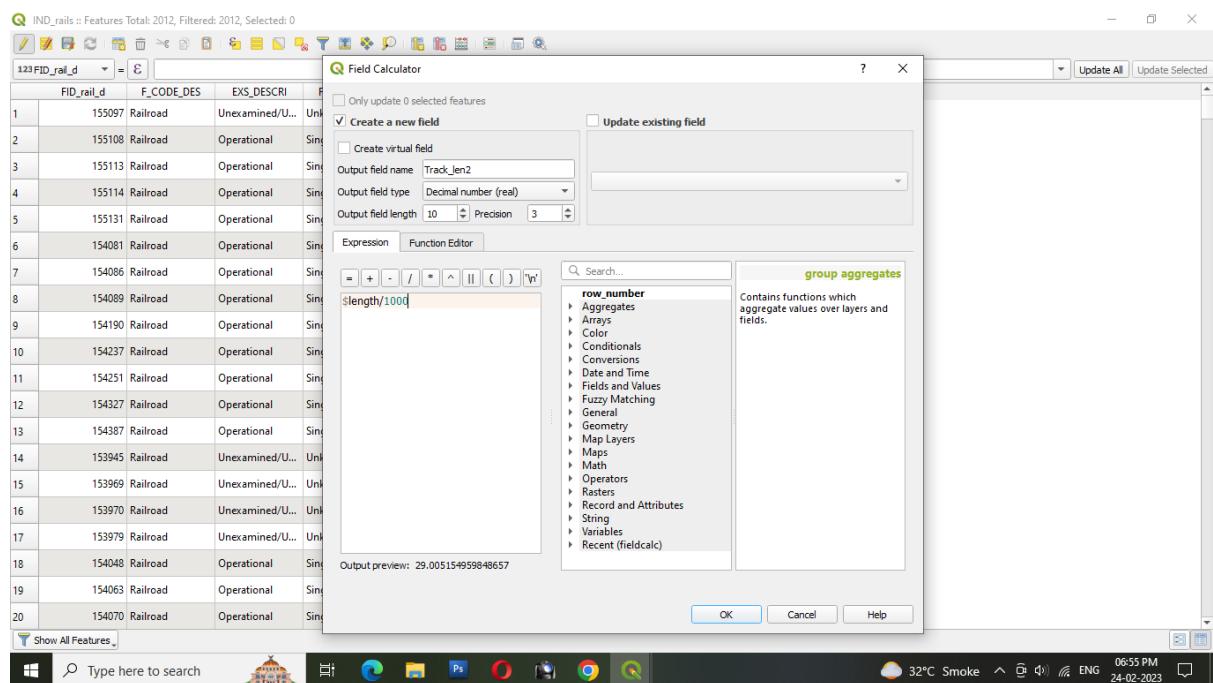




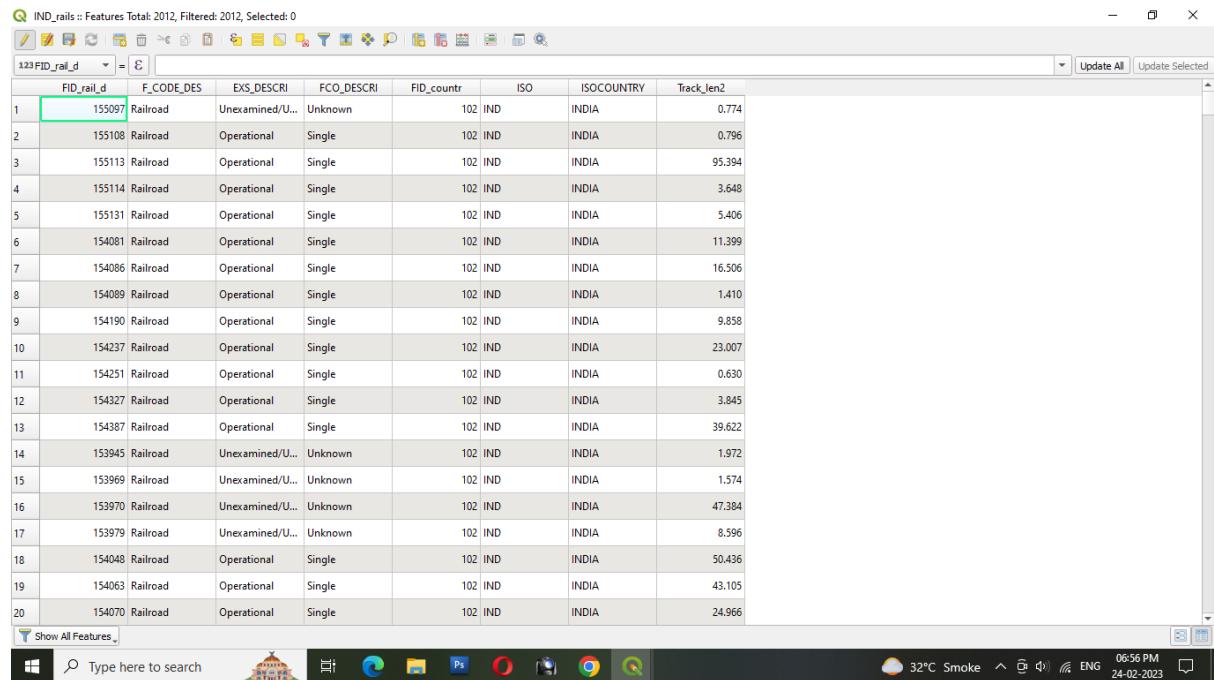
1(B) Calculating line lengths



Step 1: Open Field Calculator and set following values.



Step 2: In attribute table the Track_len2 column is added with the length value in KM.



	FID_rail_d	F_CODE_DES	EXS_DESCR	FCO_DESCR	FID_countr	ISO	ISOCOUNTRY	Track_len2
1	155097	Railroad	Unexamined/U...	Unknown	102	IND	INDIA	0.774
2	155108	Railroad	Operational	Single	102	IND	INDIA	0.796
3	155113	Railroad	Operational	Single	102	IND	INDIA	95.394
4	155114	Railroad	Operational	Single	102	IND	INDIA	3.648
5	155131	Railroad	Operational	Single	102	IND	INDIA	5.406
6	154081	Railroad	Operational	Single	102	IND	INDIA	11.399
7	154086	Railroad	Operational	Single	102	IND	INDIA	16.506
8	154089	Railroad	Operational	Single	102	IND	INDIA	1.410
9	154190	Railroad	Operational	Single	102	IND	INDIA	9.858
10	154237	Railroad	Operational	Single	102	IND	INDIA	23.007
11	154251	Railroad	Operational	Single	102	IND	INDIA	0.630
12	154327	Railroad	Operational	Single	102	IND	INDIA	3.845
13	154387	Railroad	Operational	Single	102	IND	INDIA	39.622
14	153945	Railroad	Unexamined/U...	Unknown	102	IND	INDIA	1.972
15	153969	Railroad	Unexamined/U...	Unknown	102	IND	INDIA	1.574
16	153970	Railroad	Unexamined/U...	Unknown	102	IND	INDIA	47.384
17	153979	Railroad	Unexamined/U...	Unknown	102	IND	INDIA	8.596
18	154048	Railroad	Operational	Single	102	IND	INDIA	50.436
19	154063	Railroad	Operational	Single	102	IND	INDIA	43.105
20	154070	Railroad	Operational	Single	102	IND	INDIA	24.966

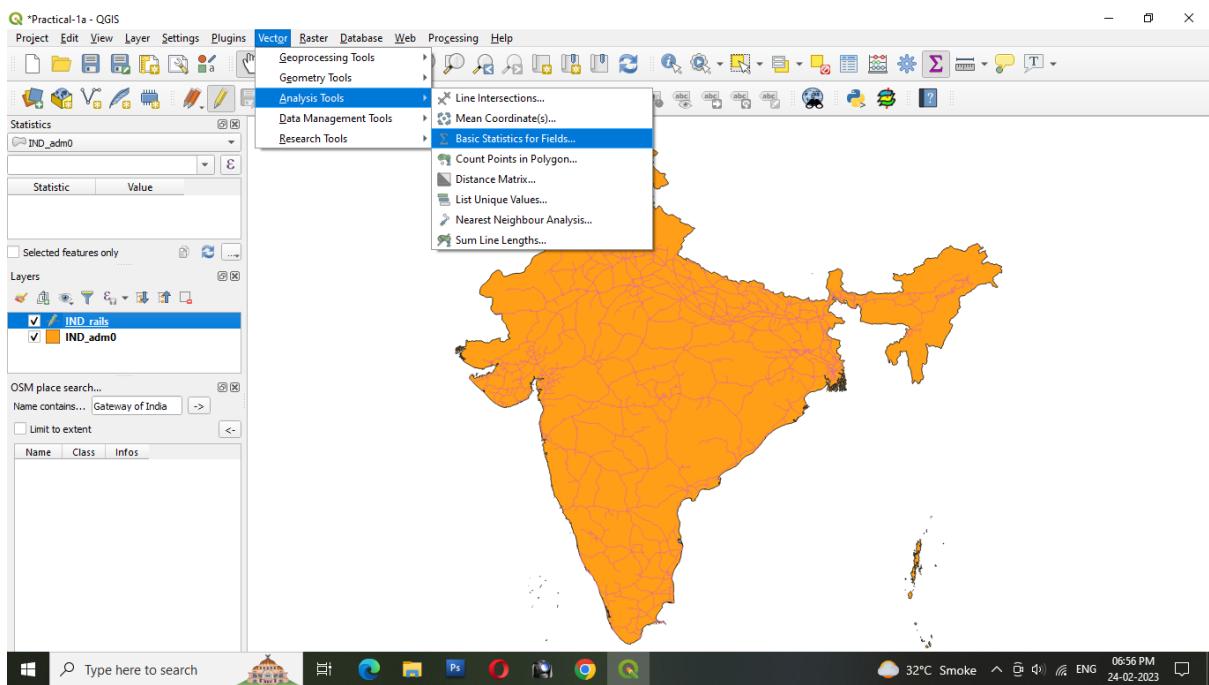
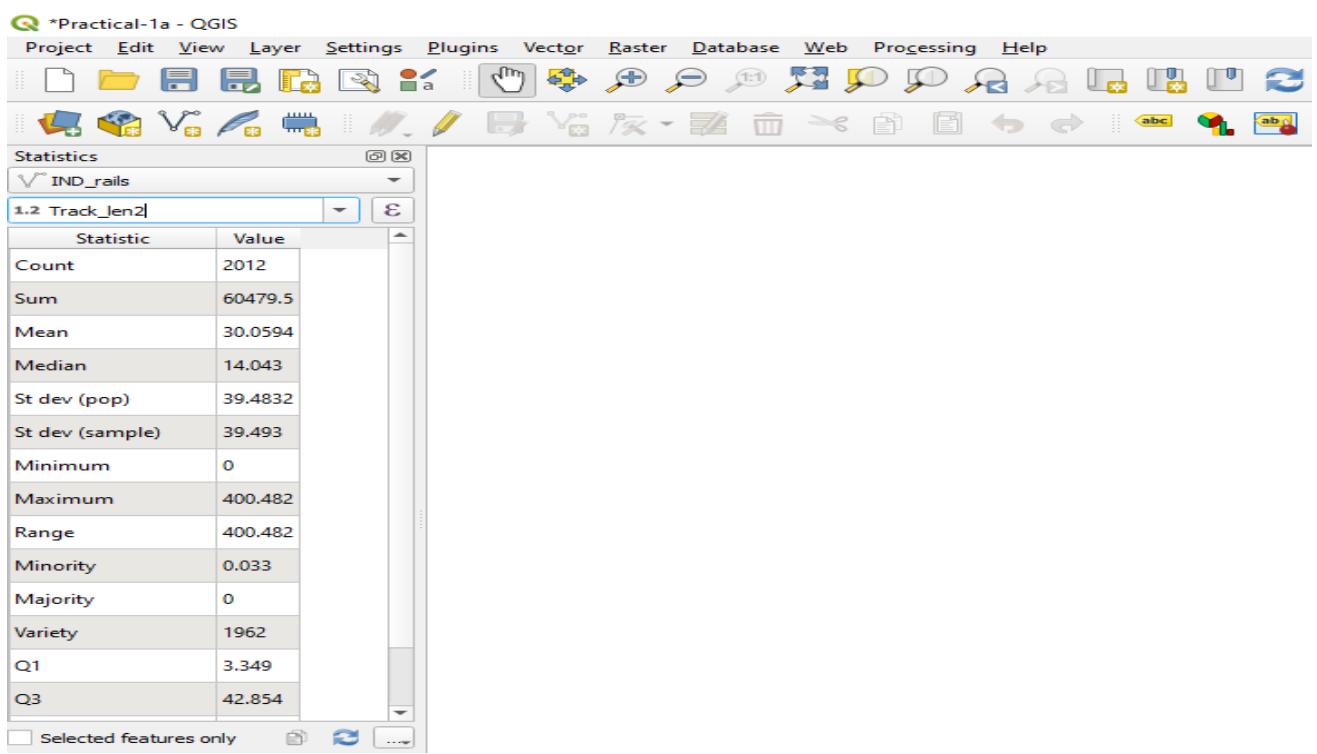
Formatting

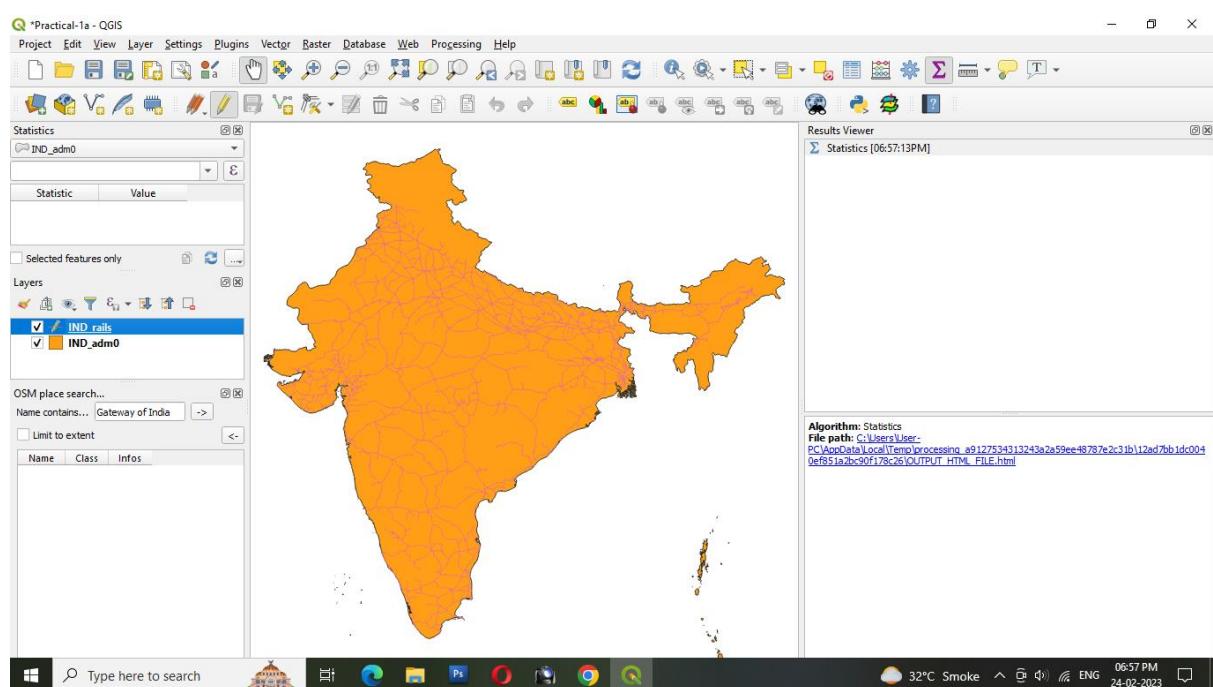
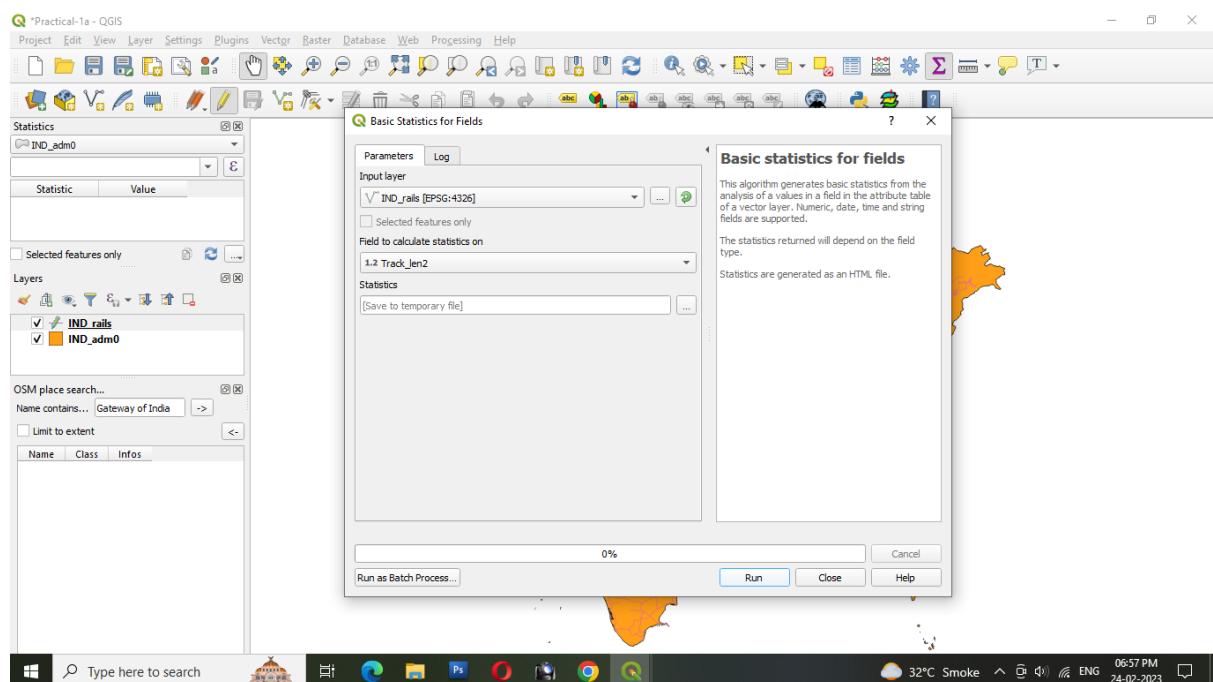
Double click on layer -> select layer -> Label with -> Track_len2.

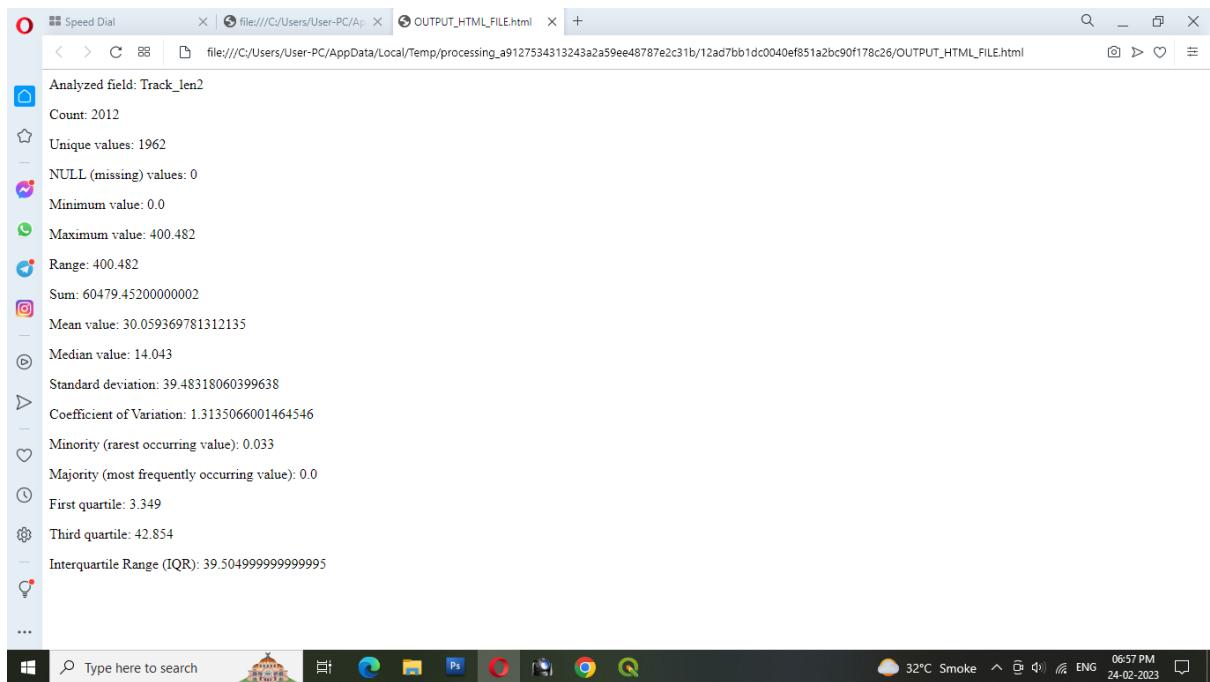
Statistics

Basic statistics is shown as follows:



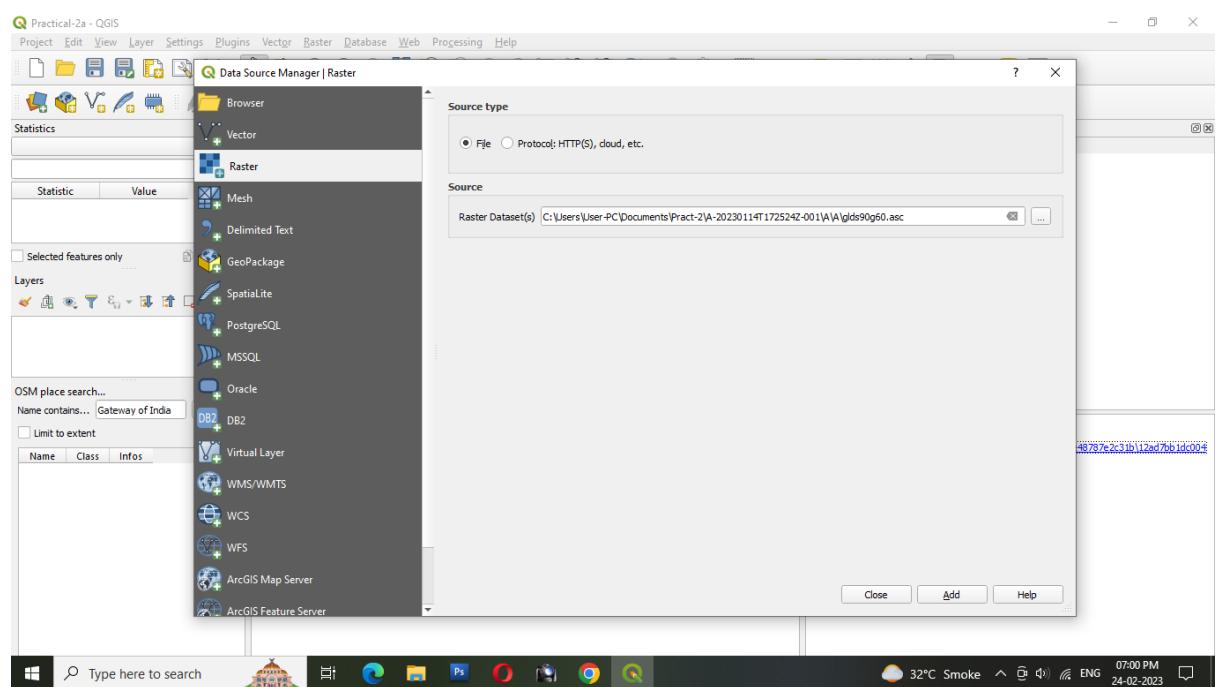
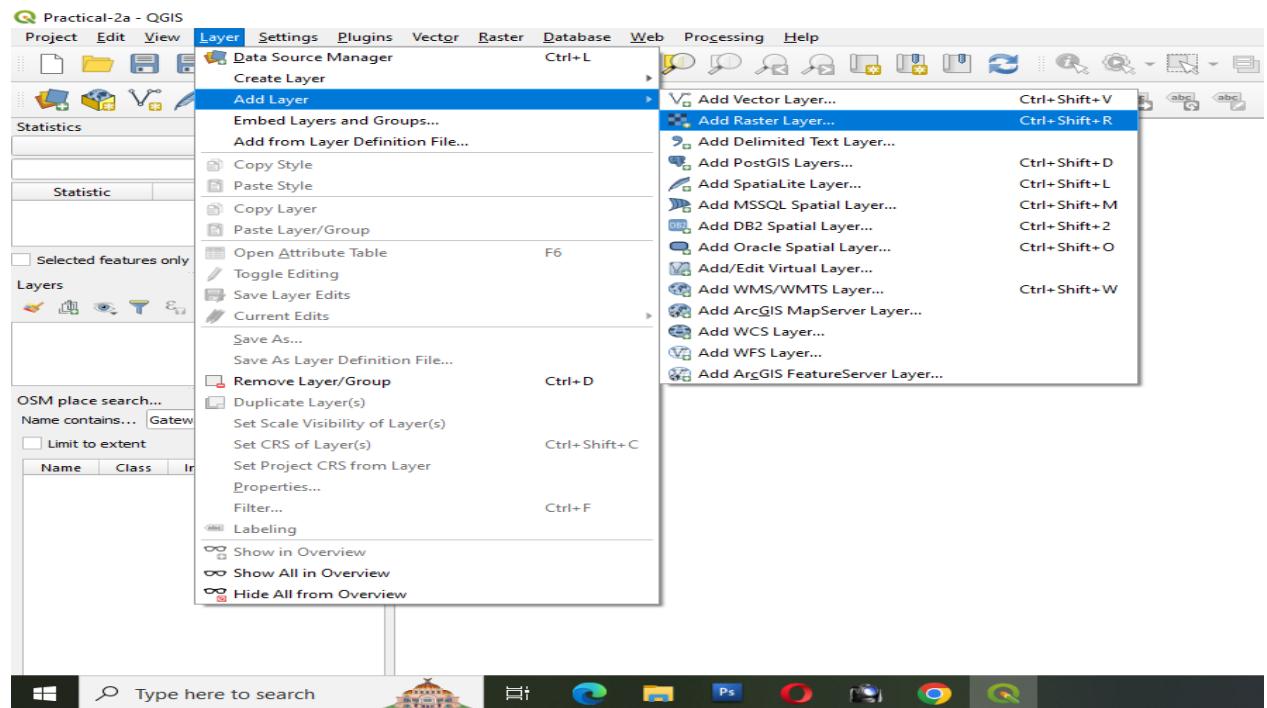


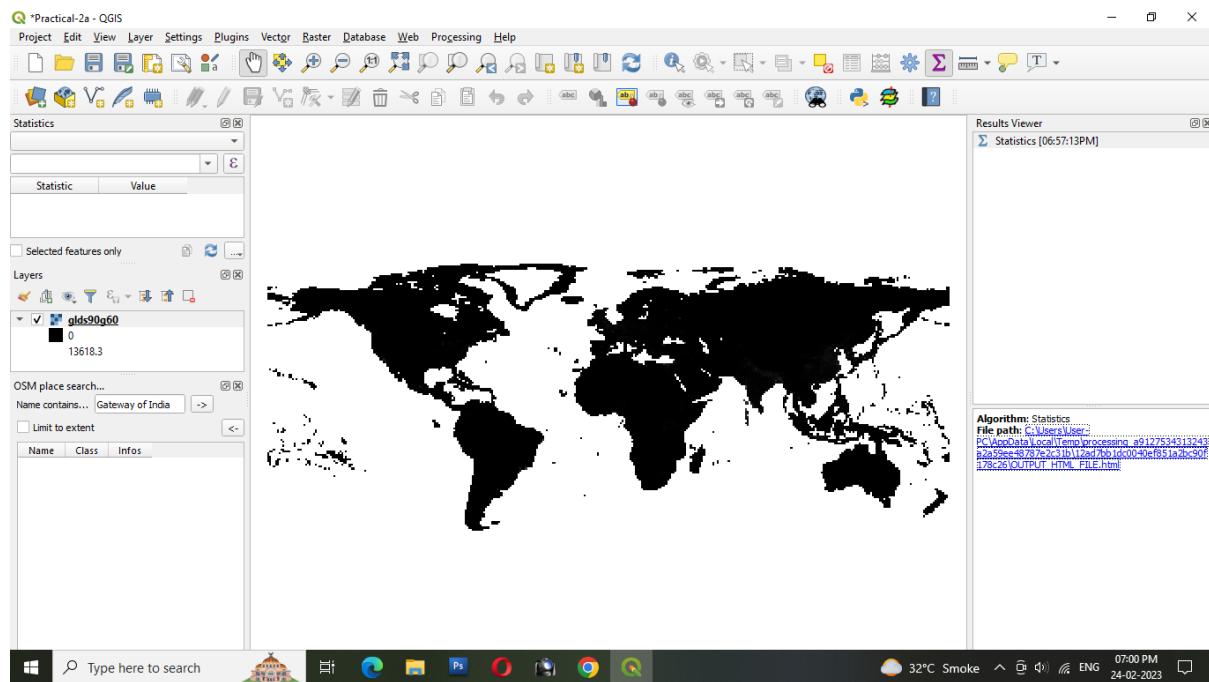




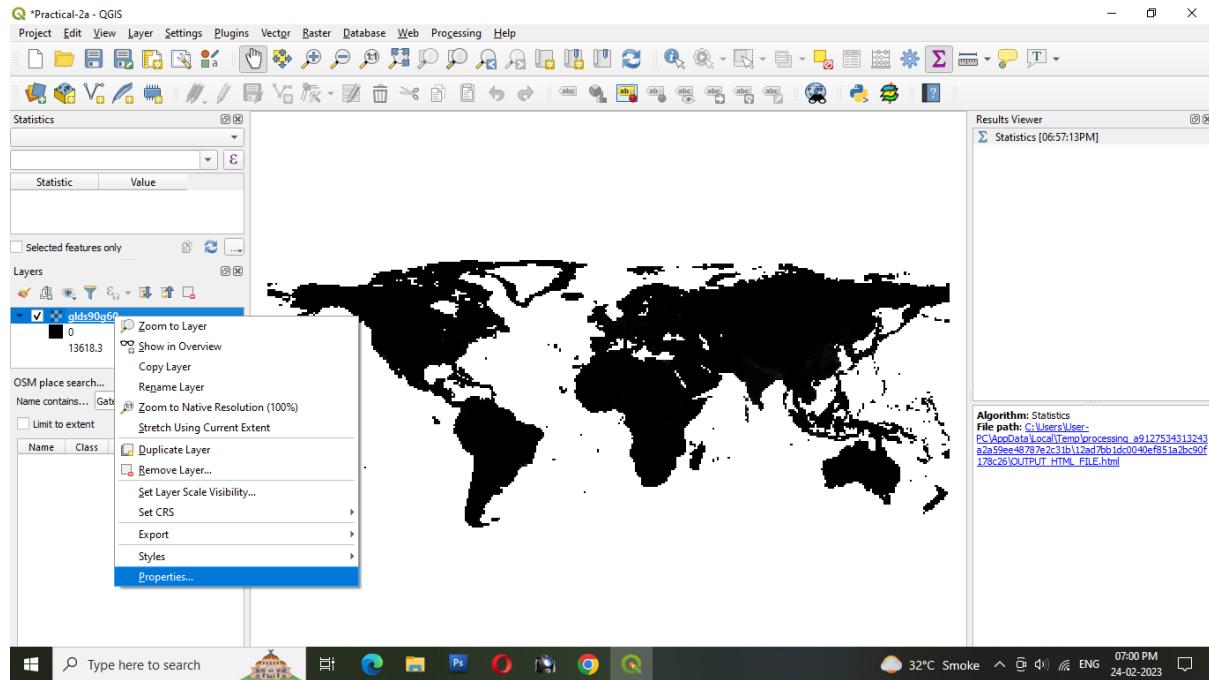
Practical 2: EXPLORING AND MANAGING RASTER DATA

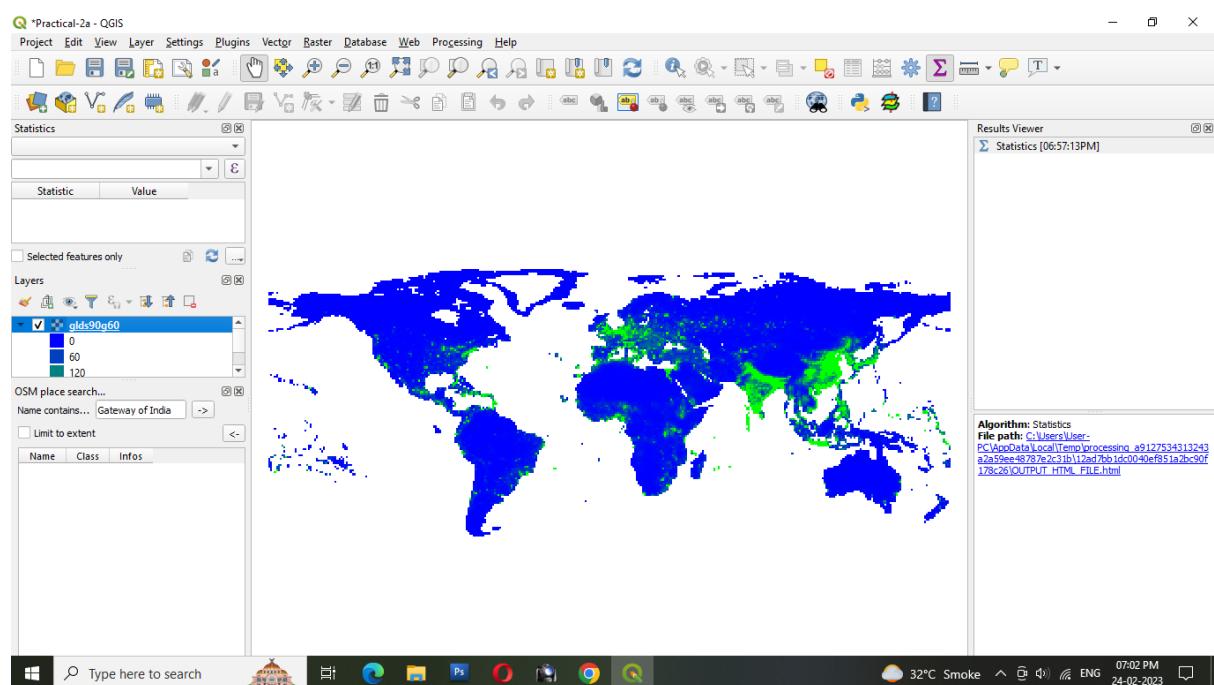
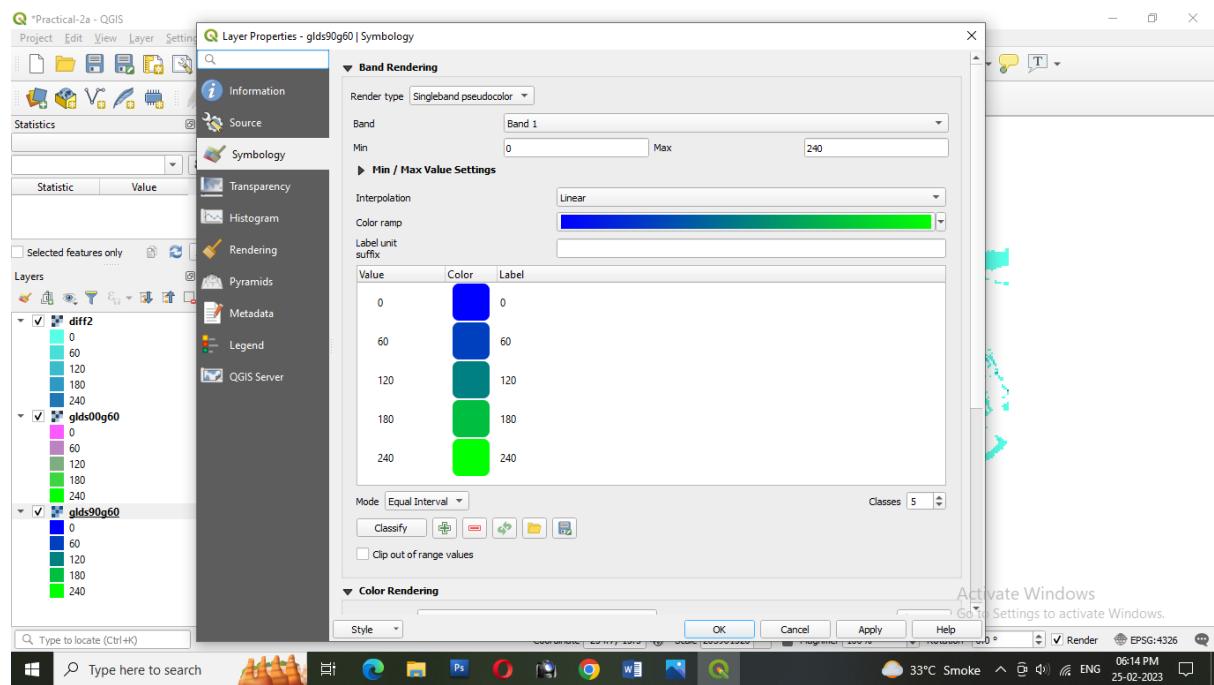
2(A) Adding raster layers

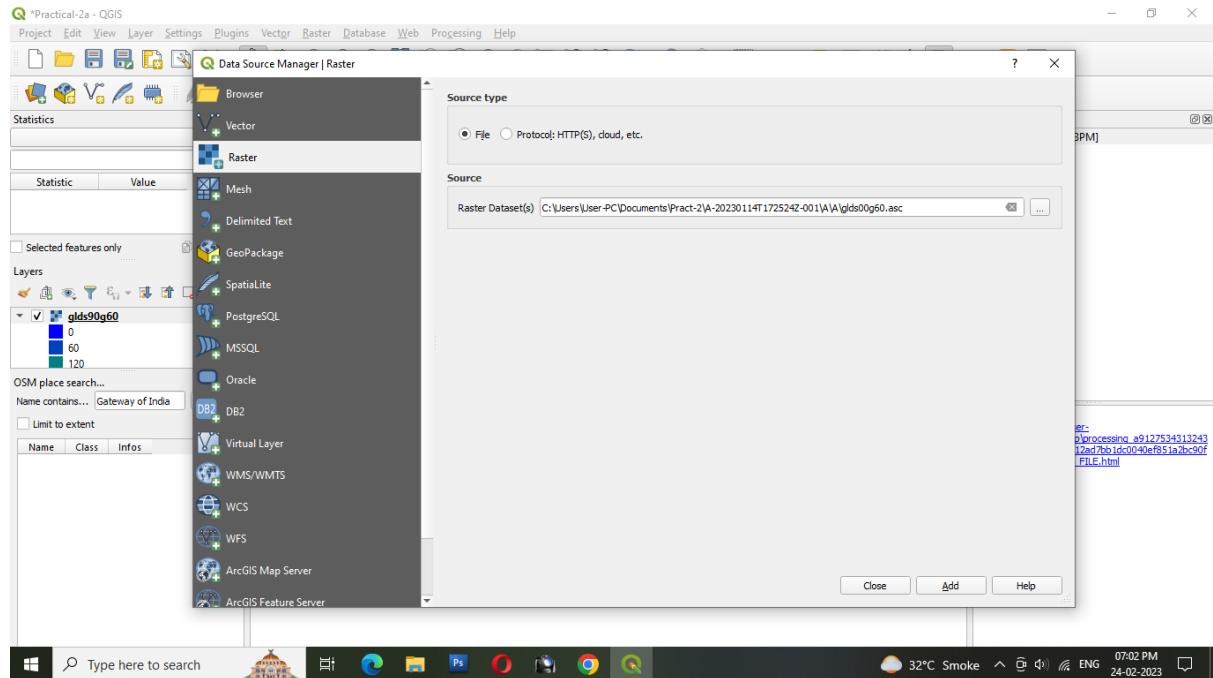
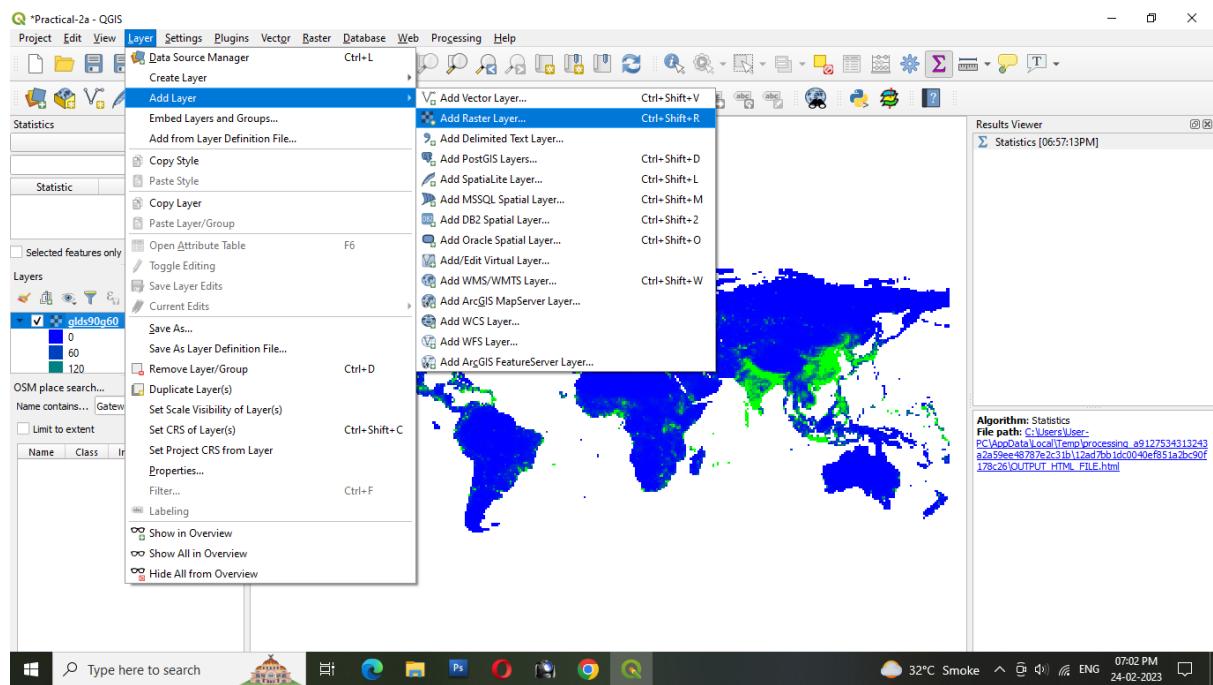


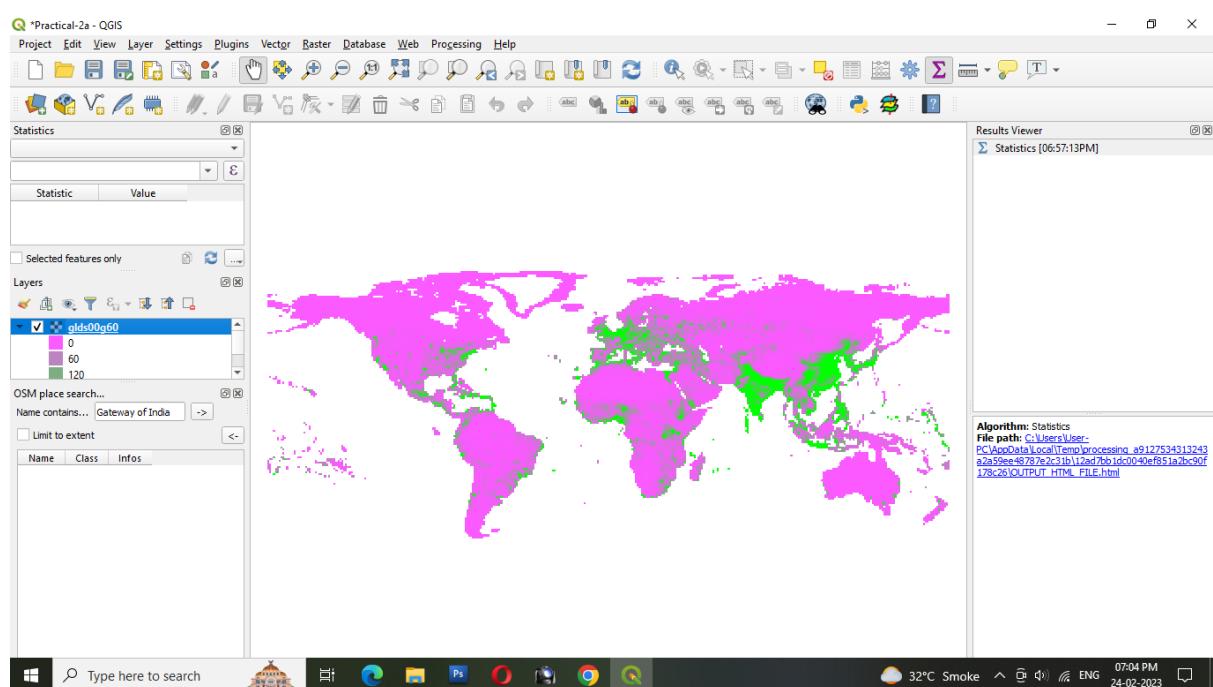
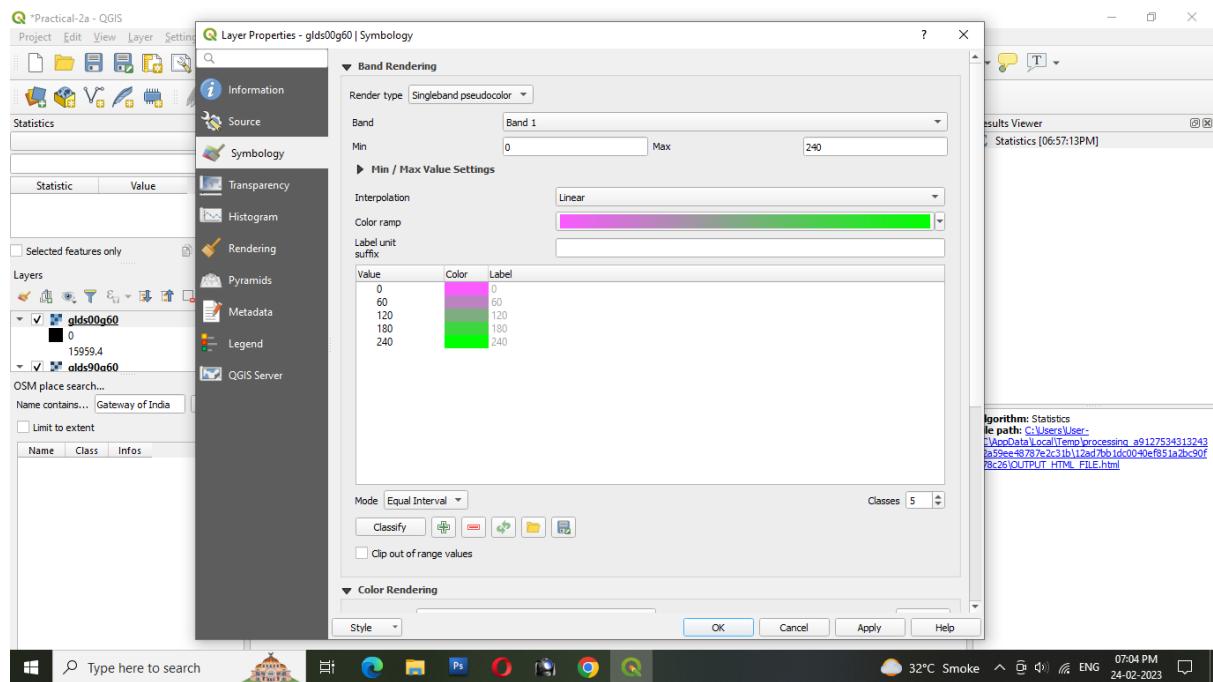


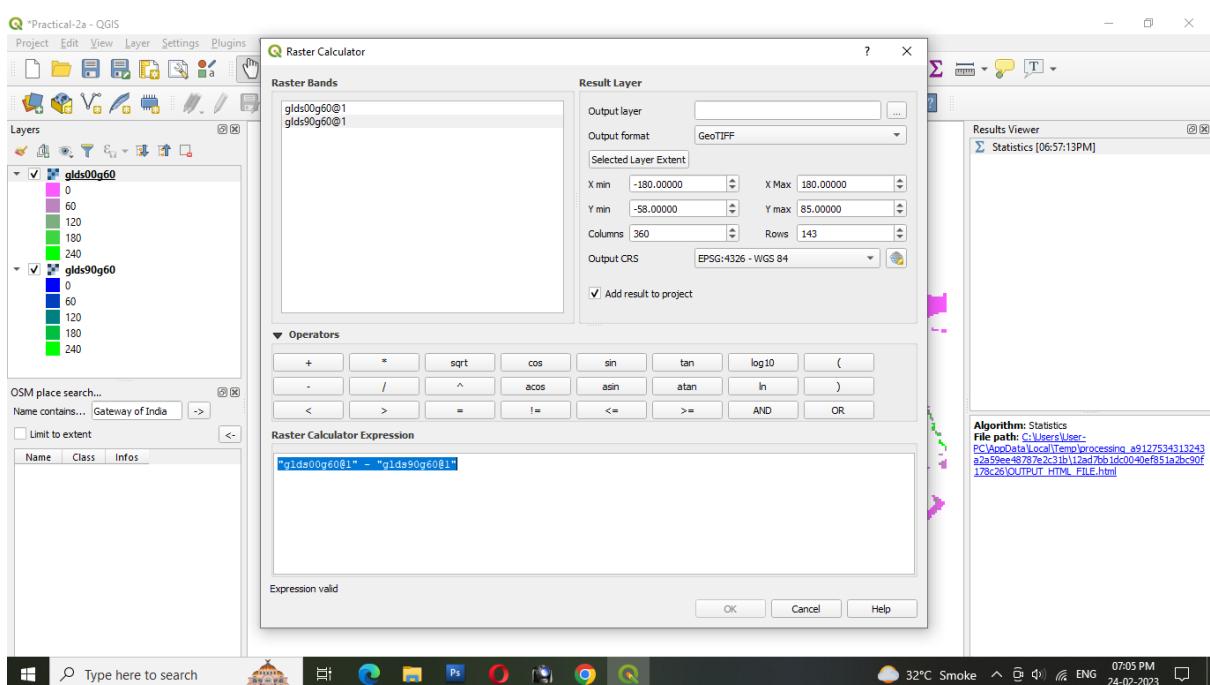
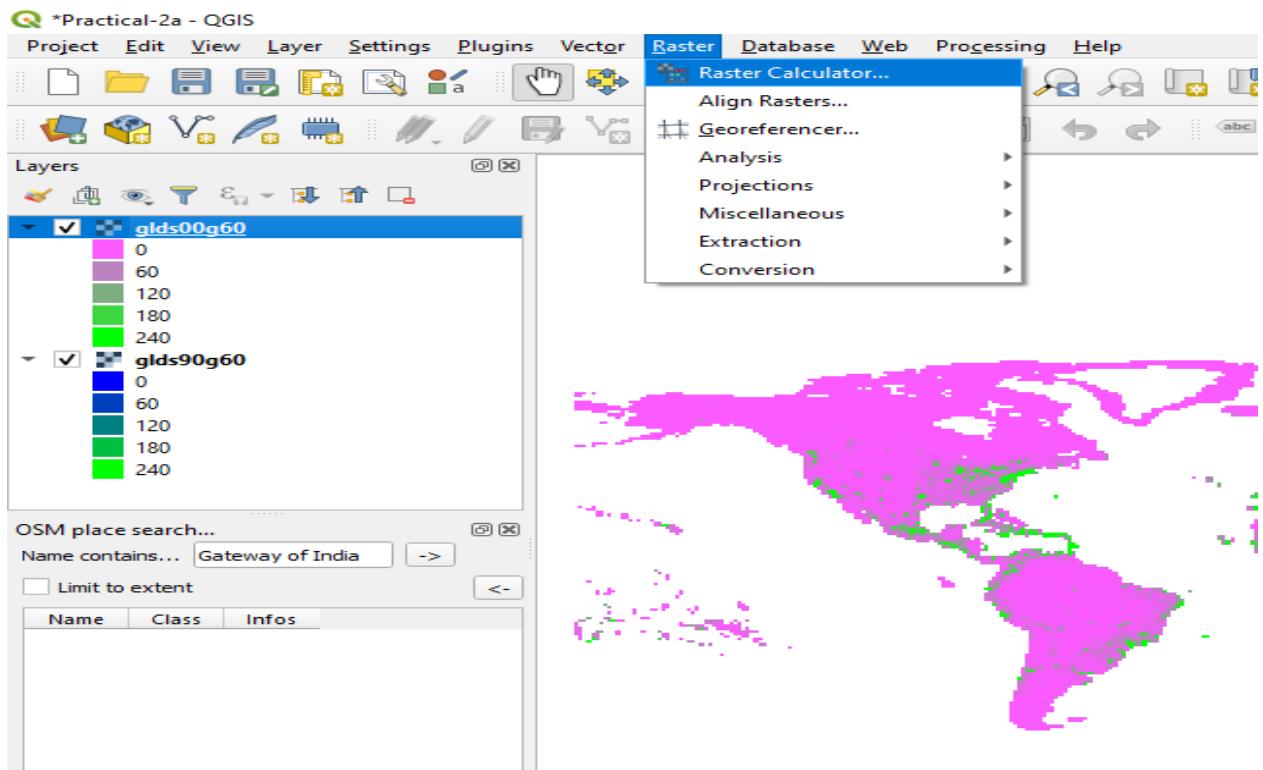
2(B) Raster styling and analysis

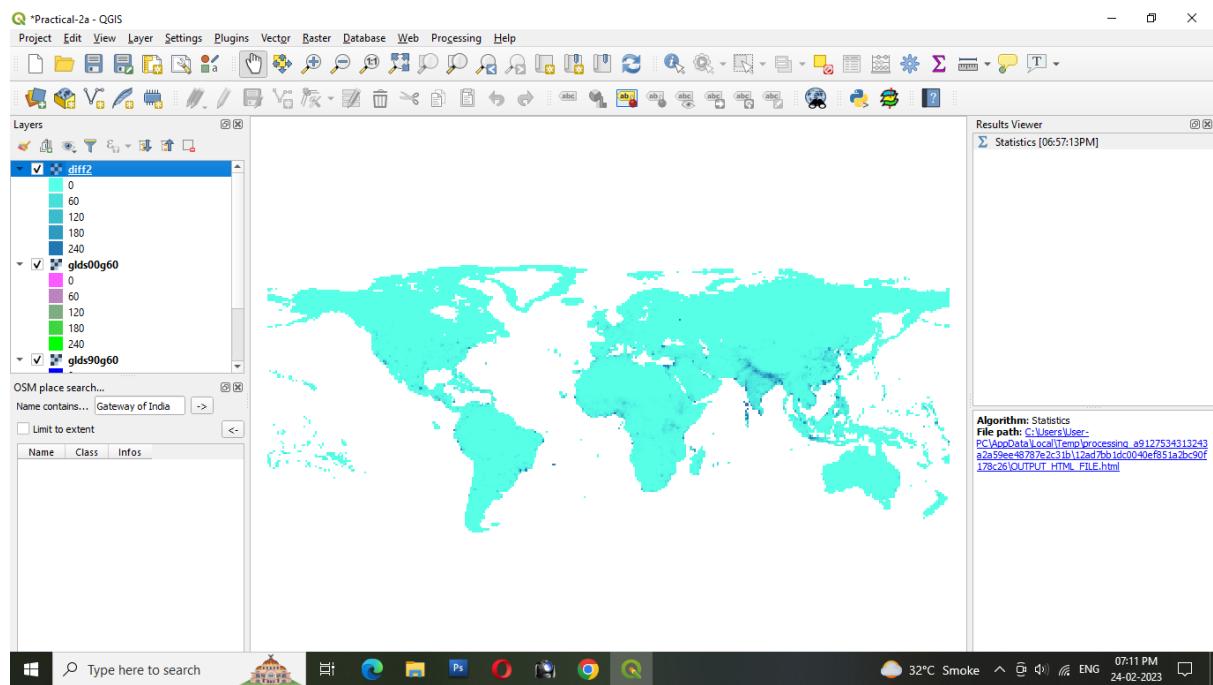




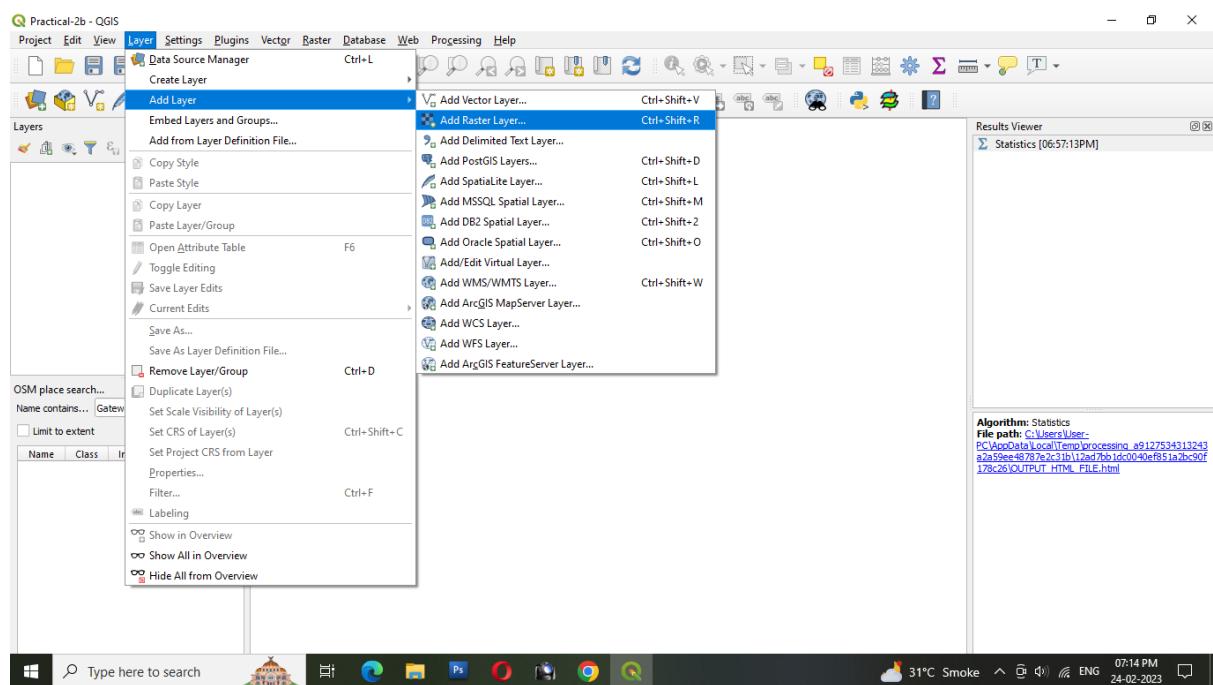


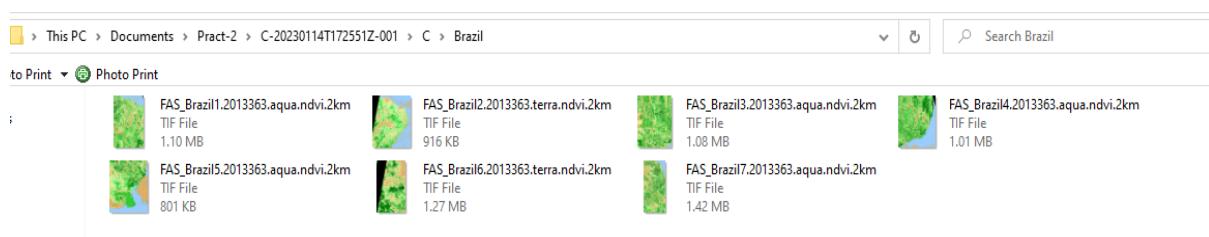
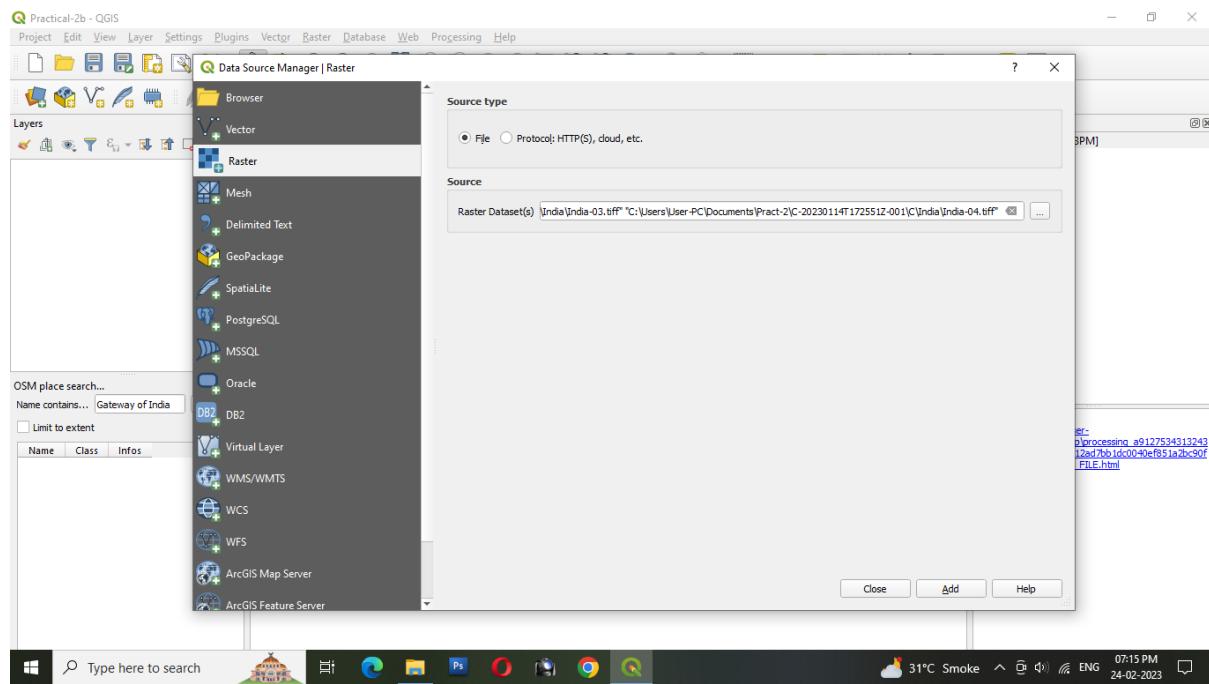


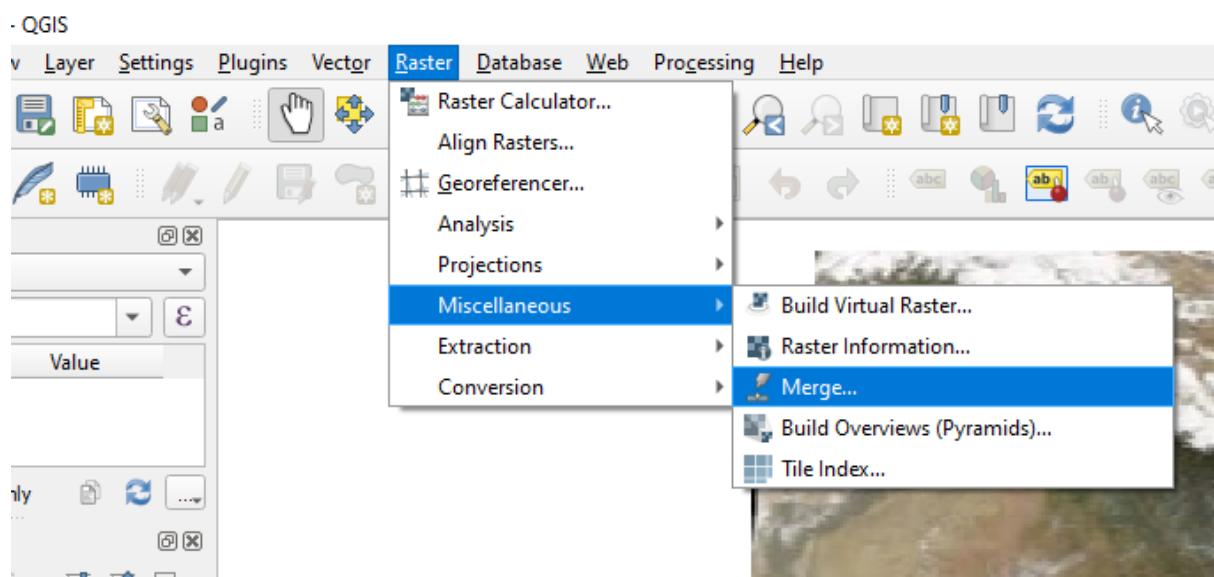
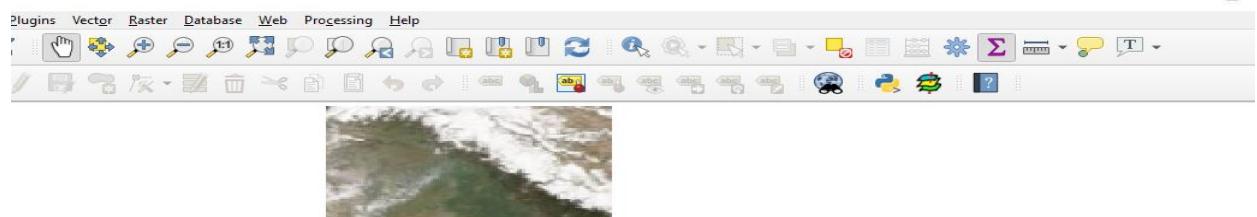


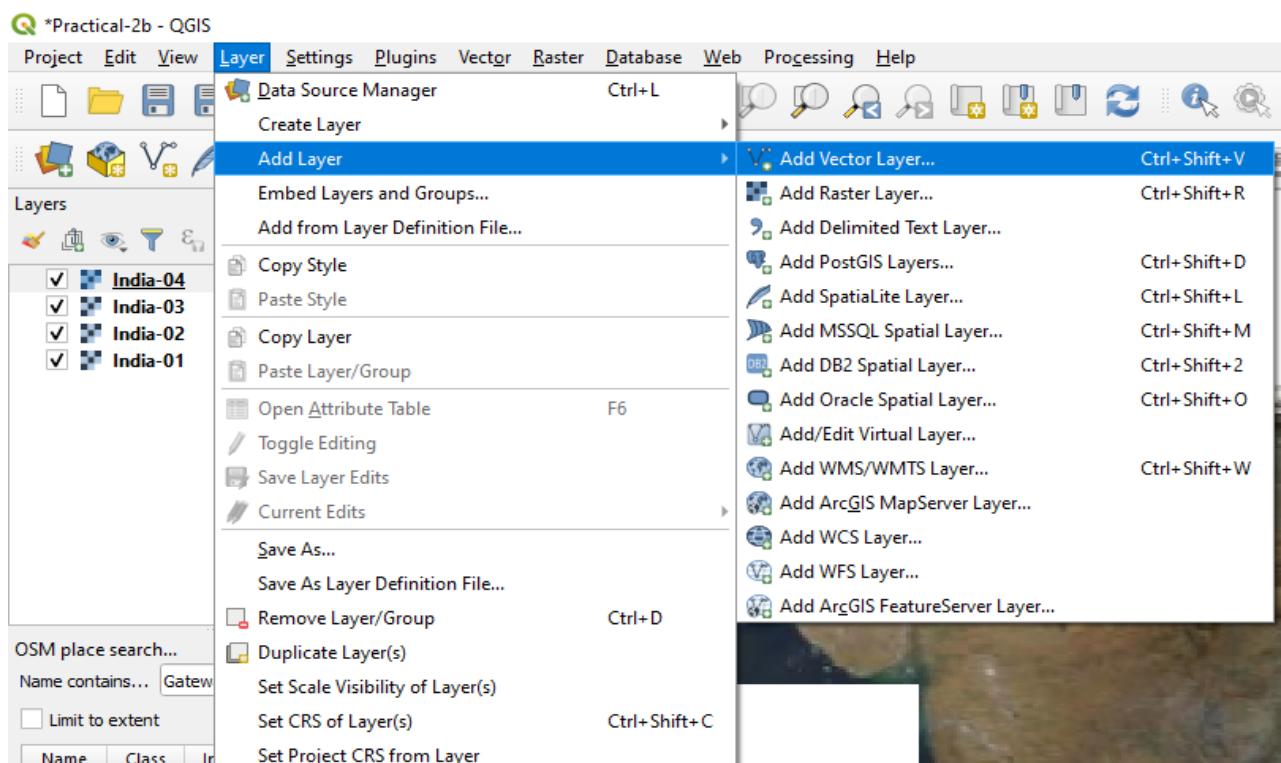
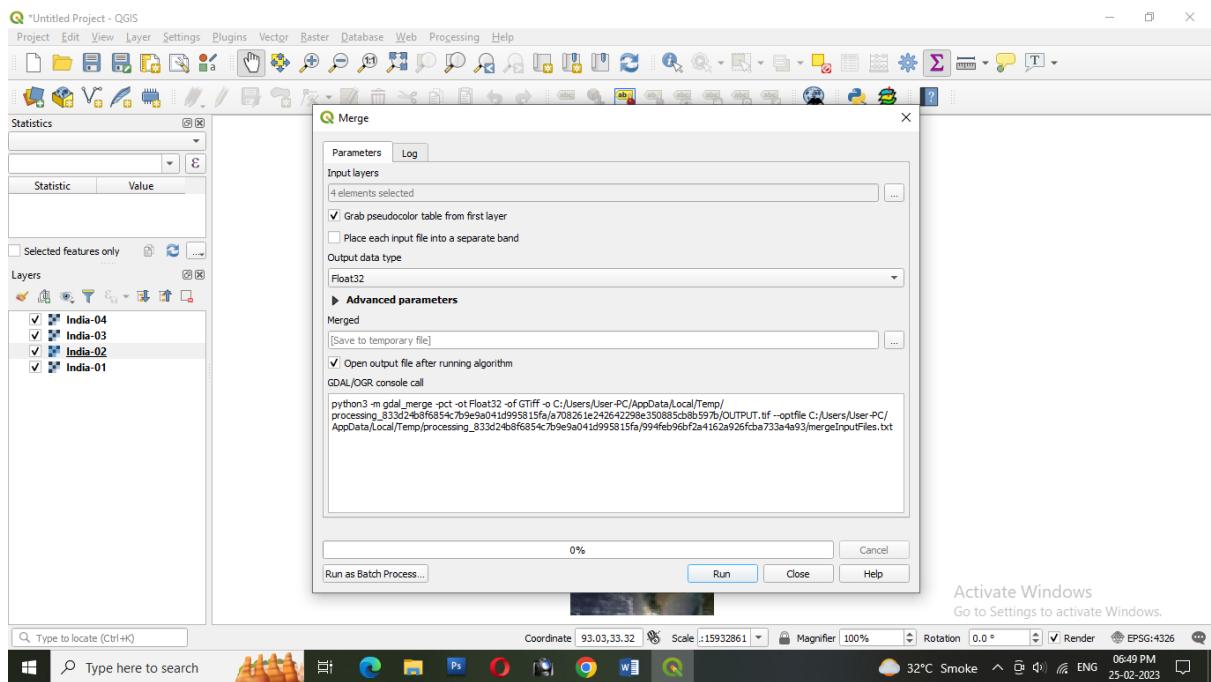


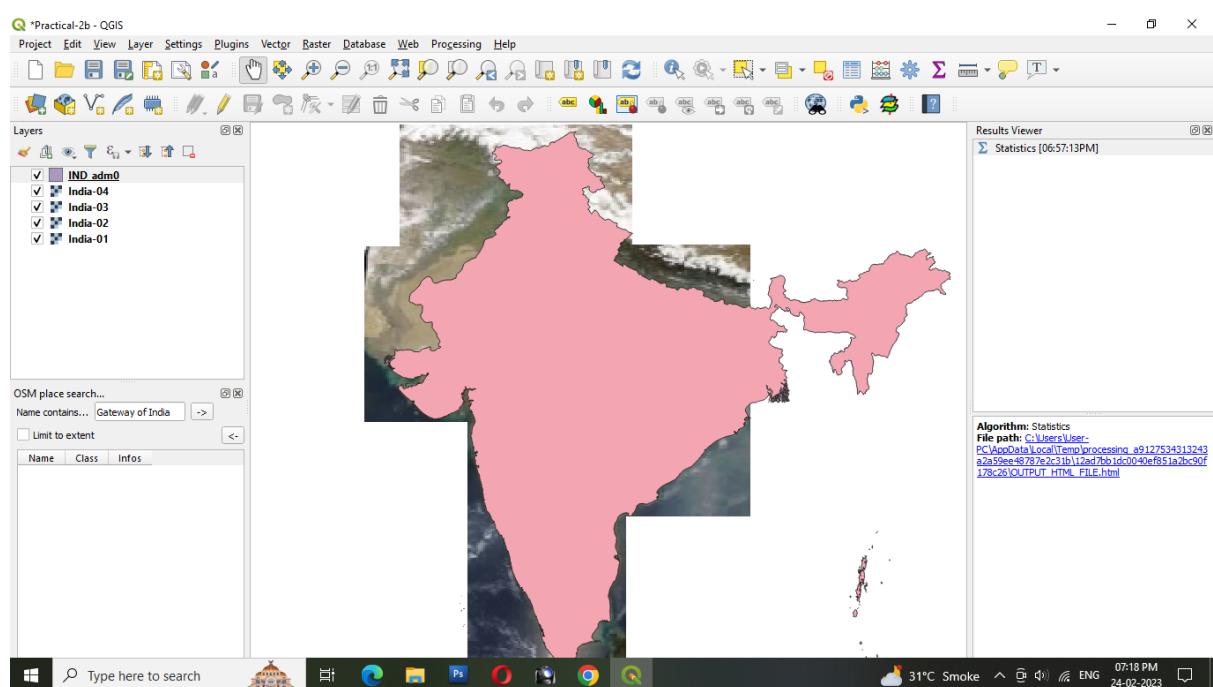
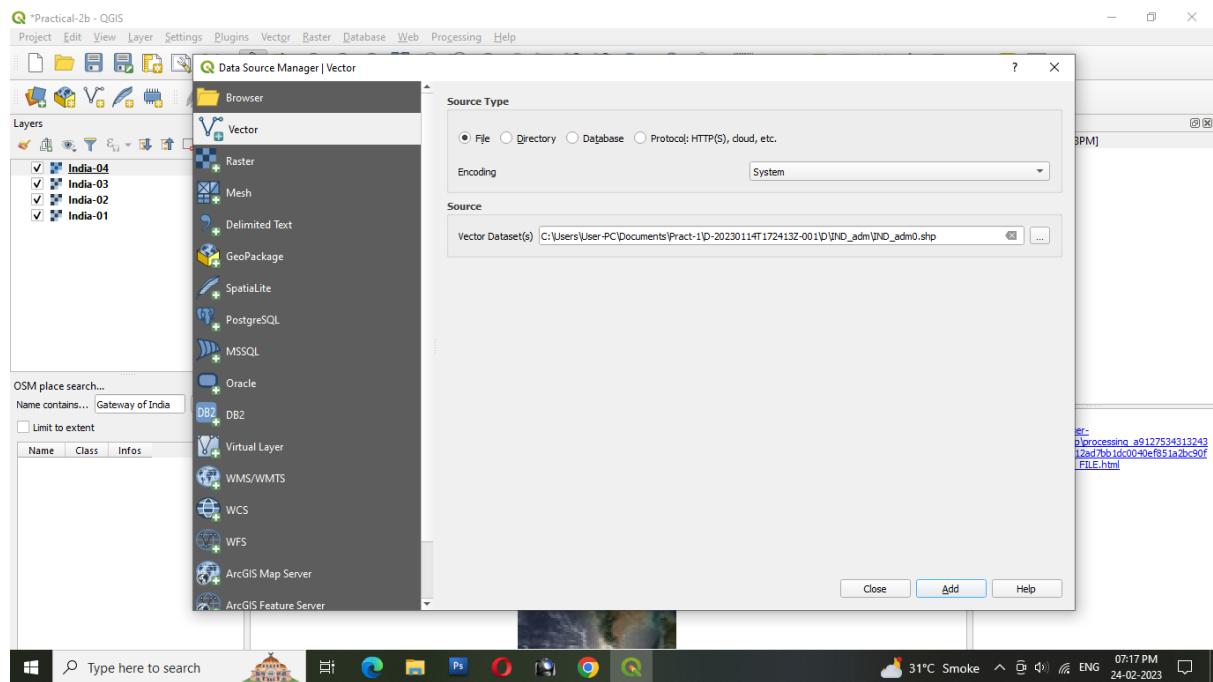
2(C) Raster mosaicing and clipping





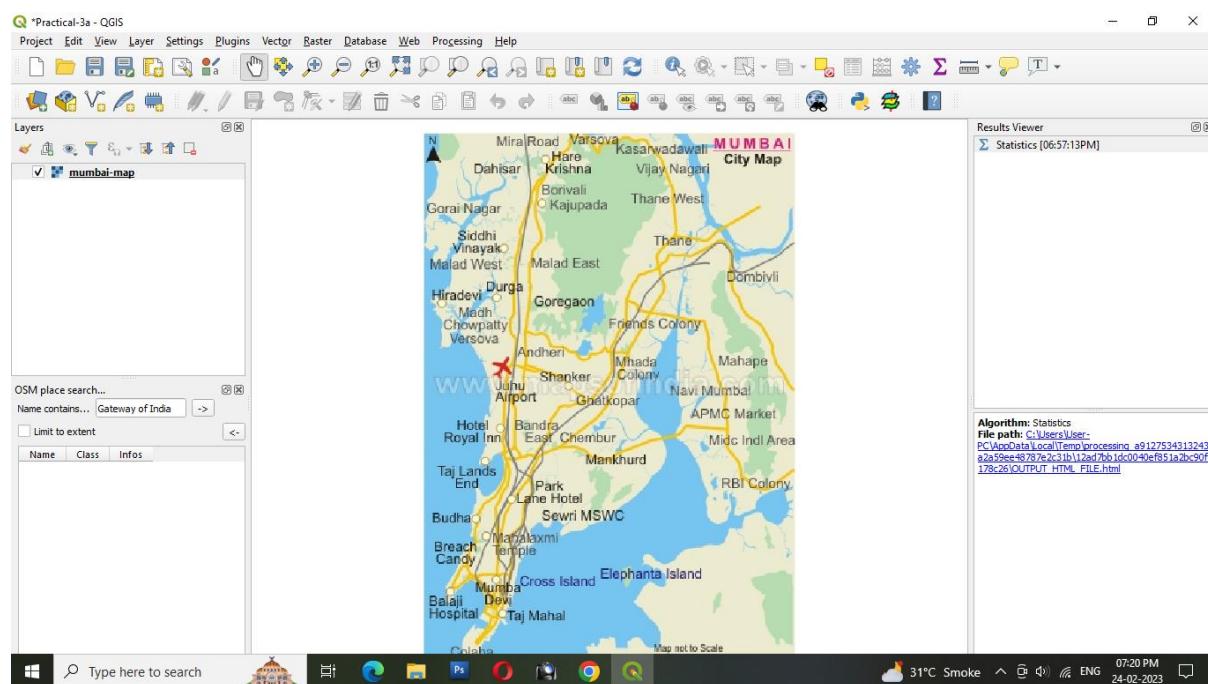
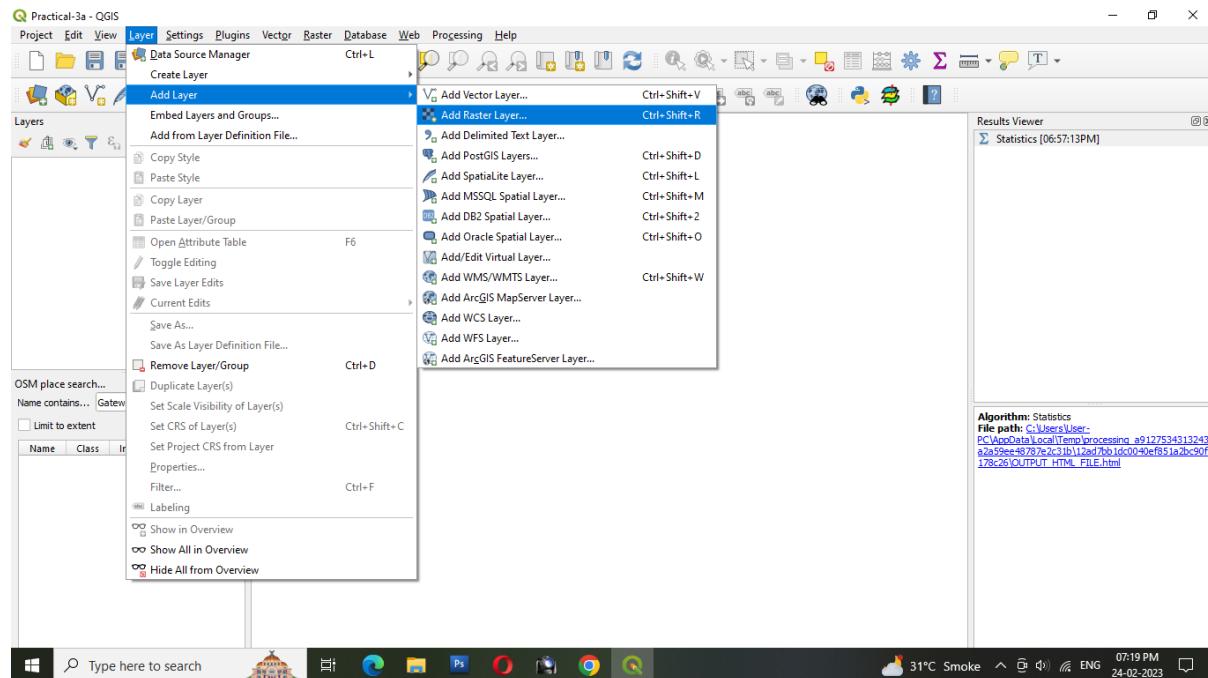


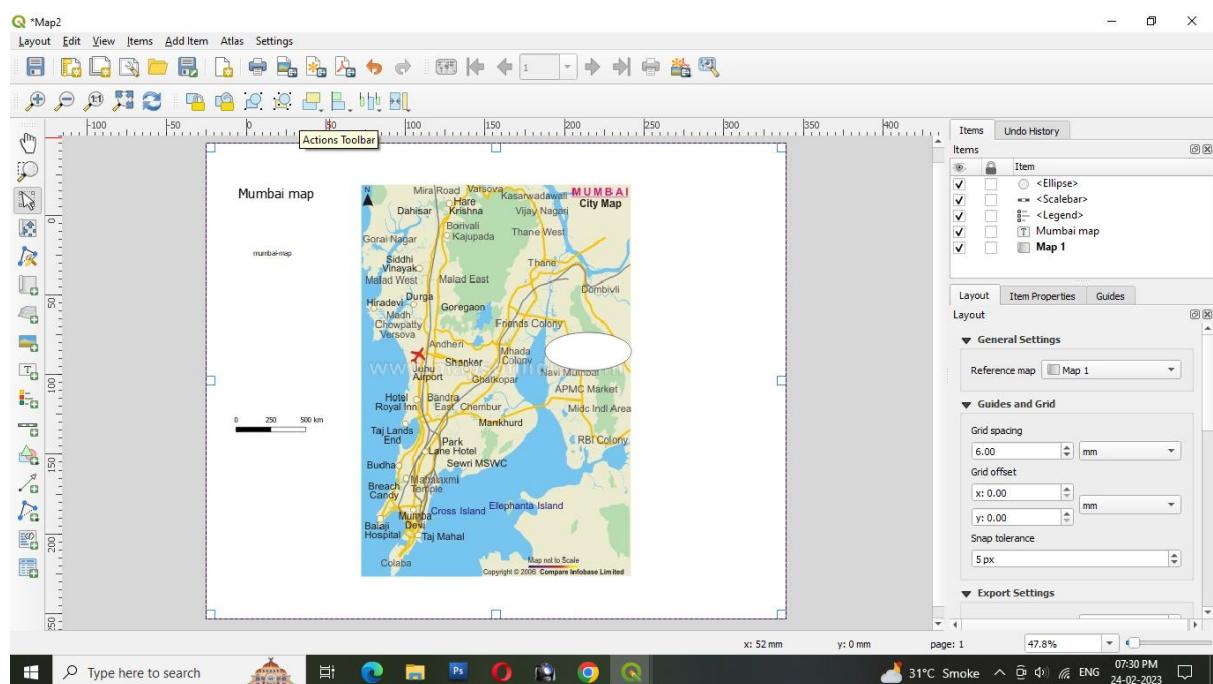
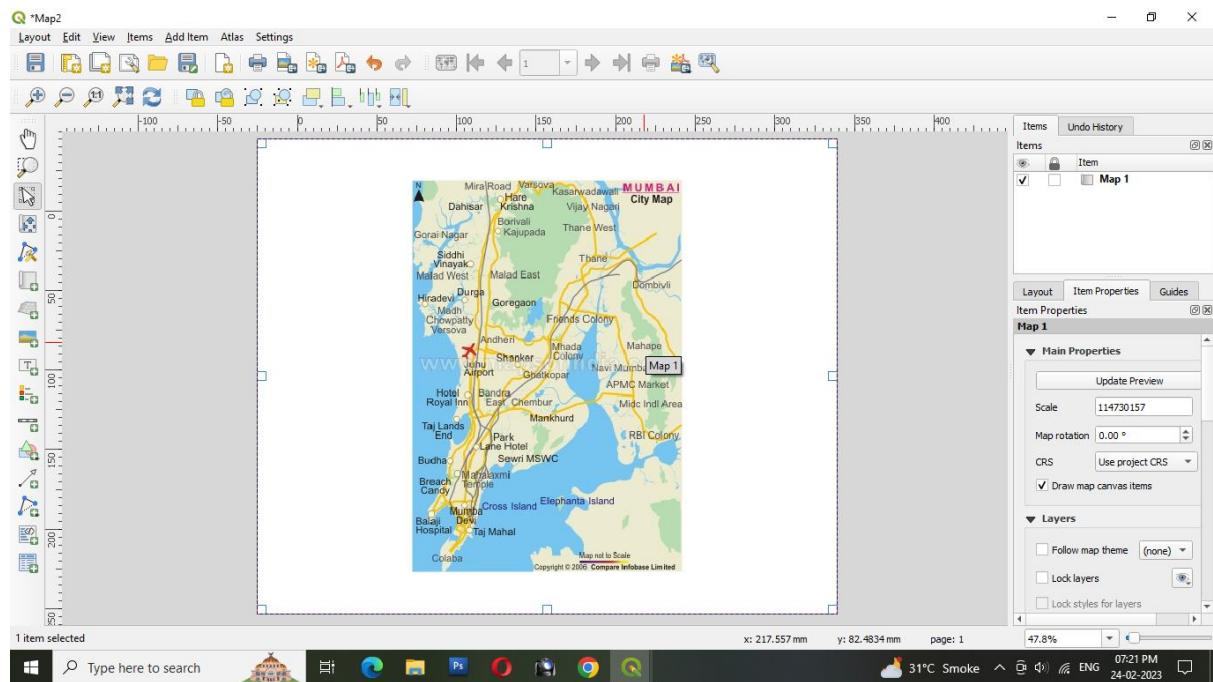


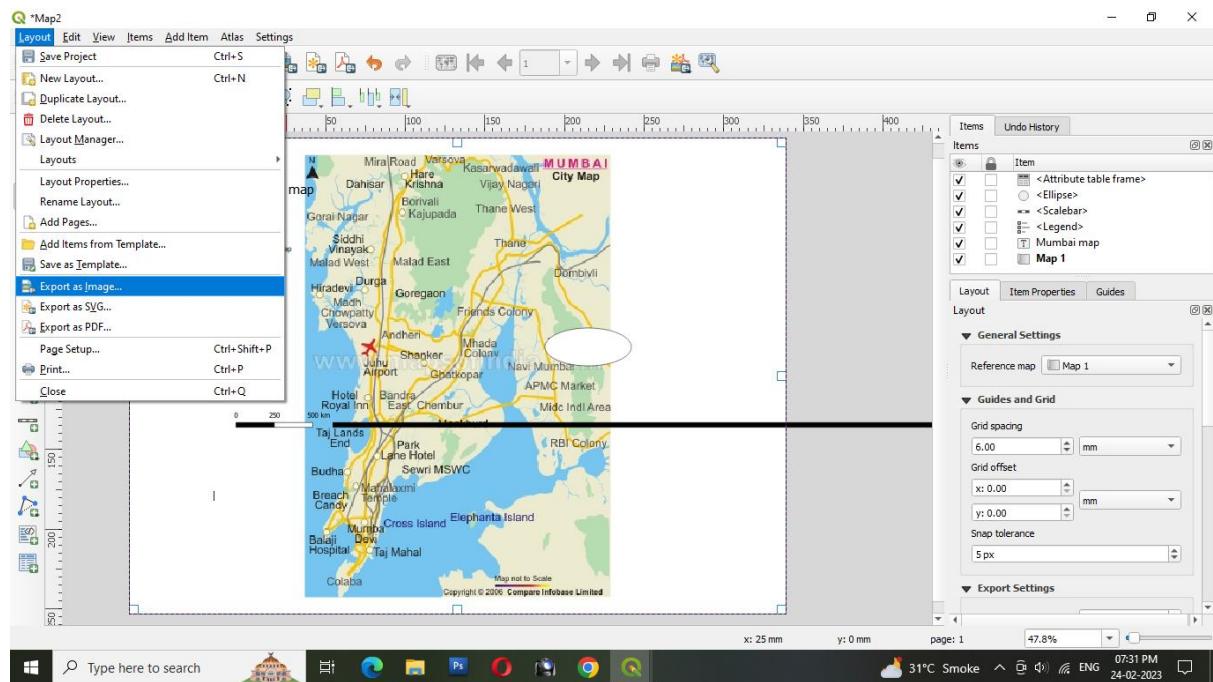


Practical 3: MAKING A MAP, WORKING WITH ATTRIBUTES

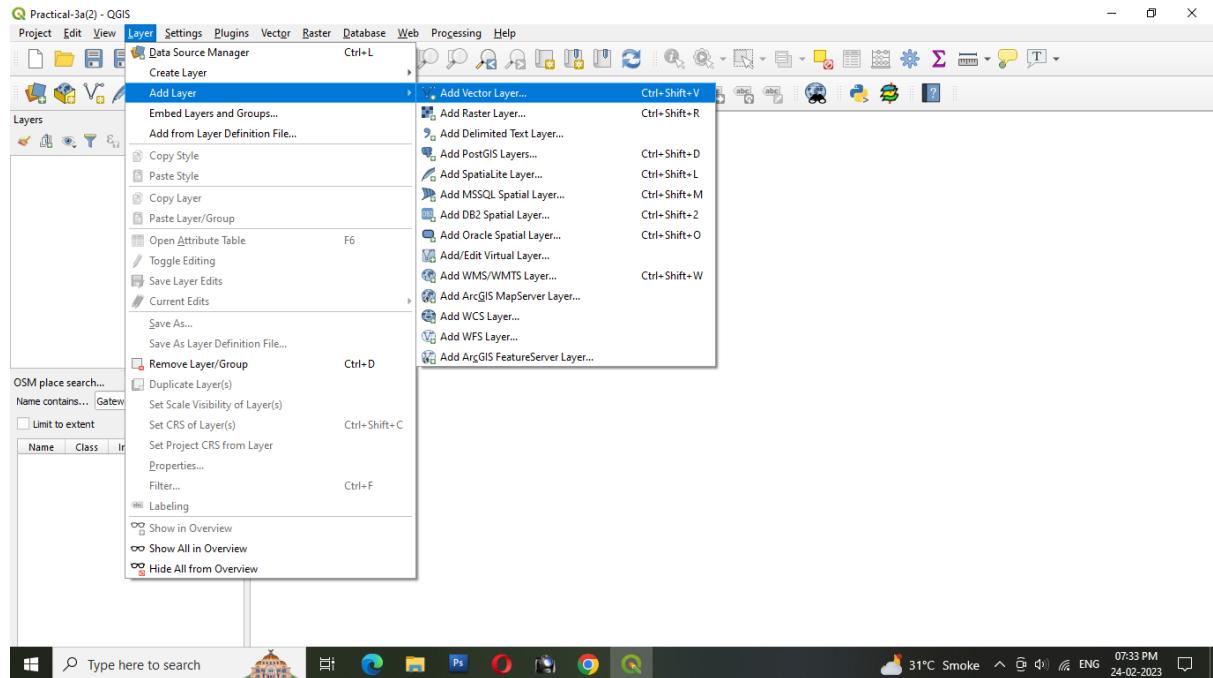
3(A) Making a map using Raster data

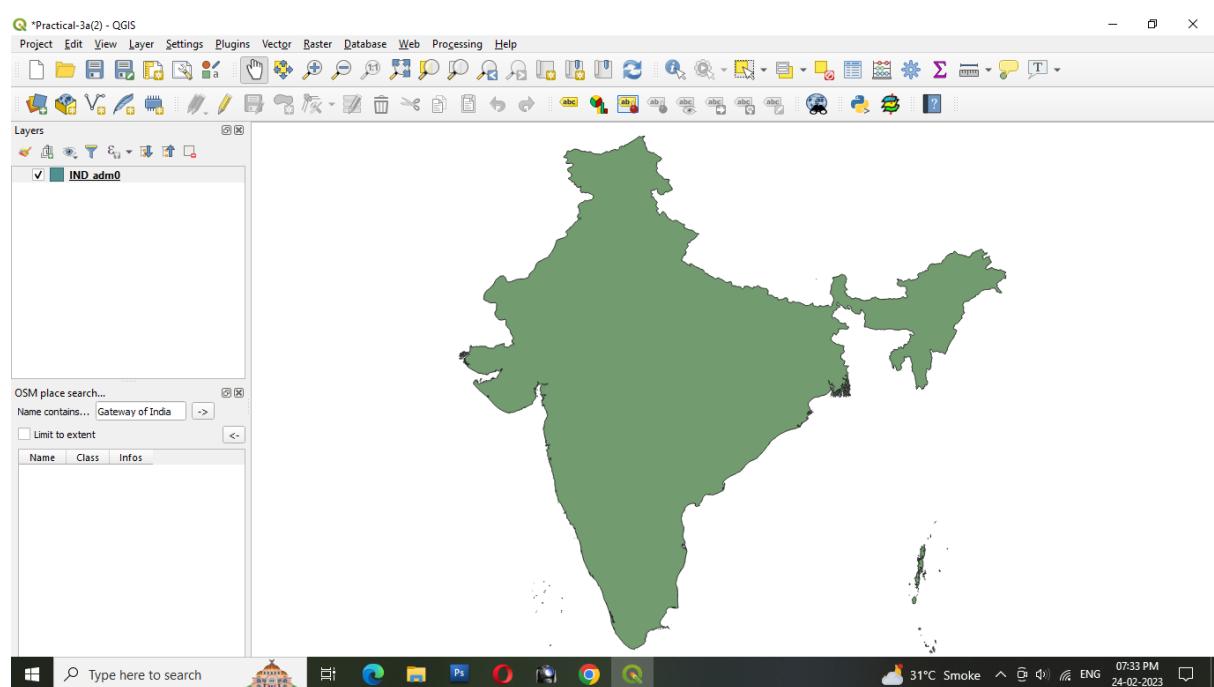
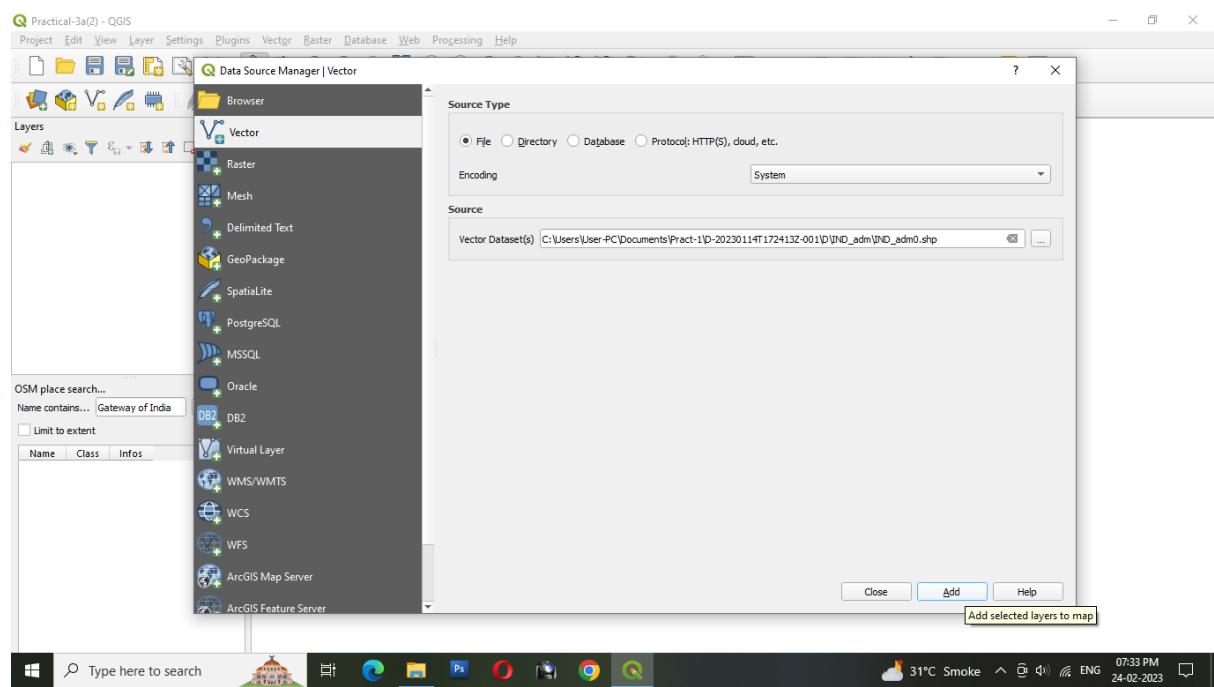


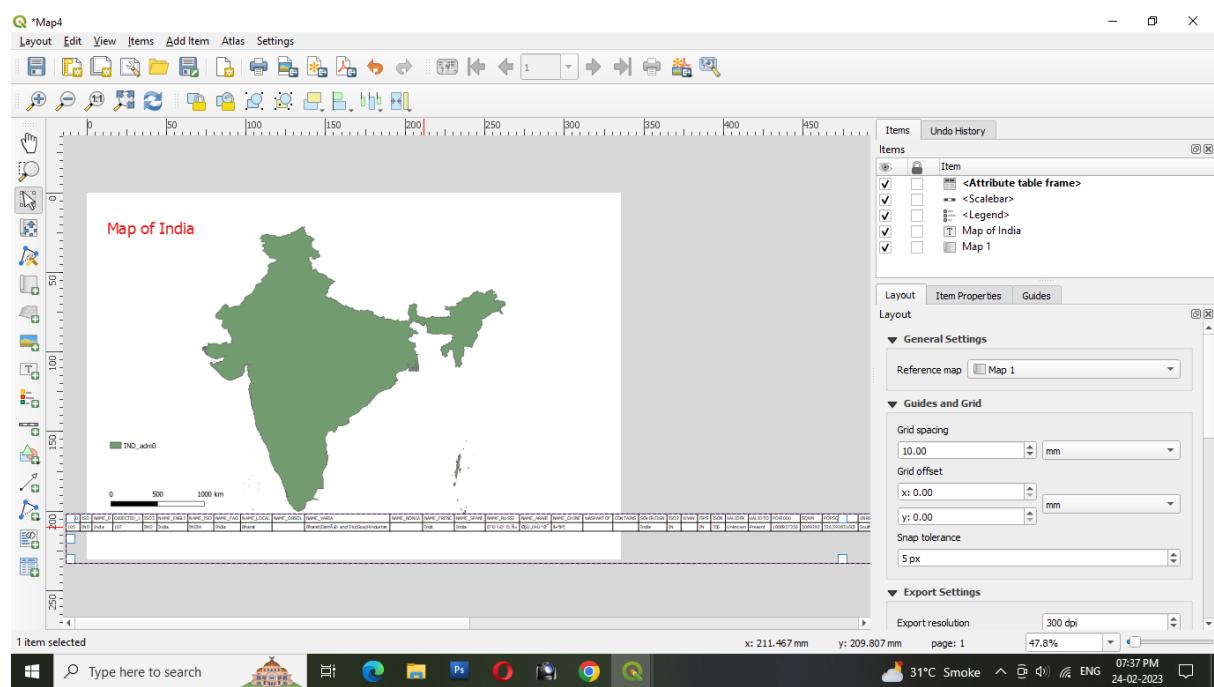
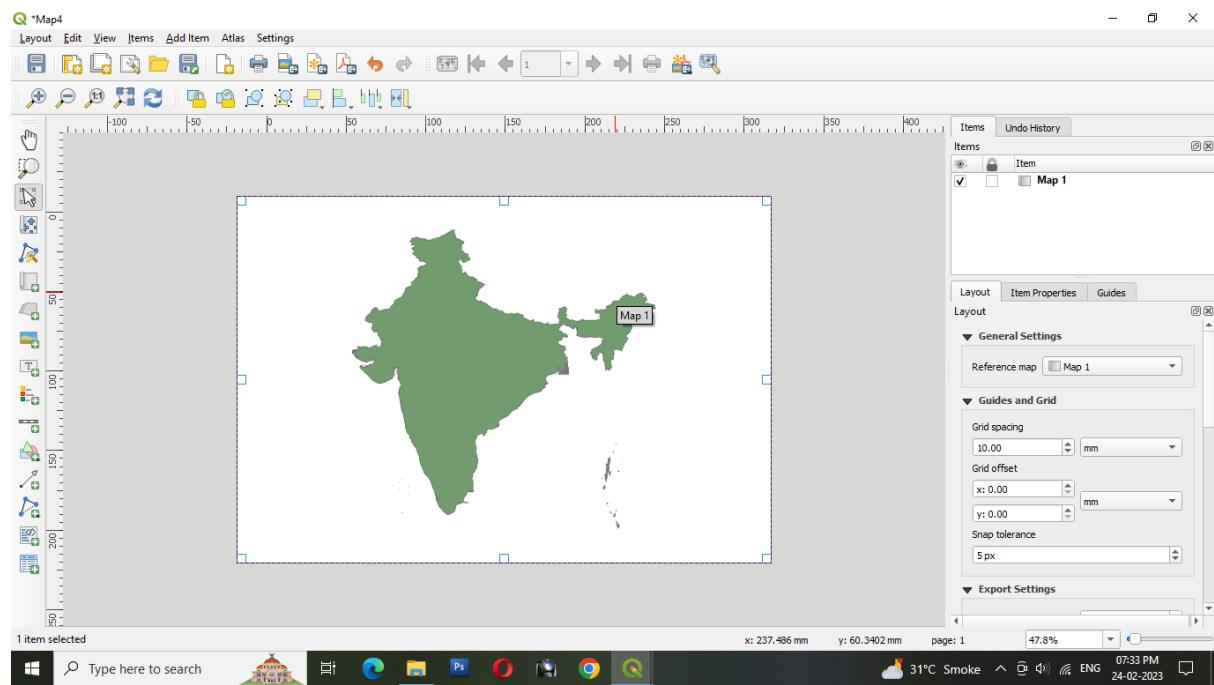




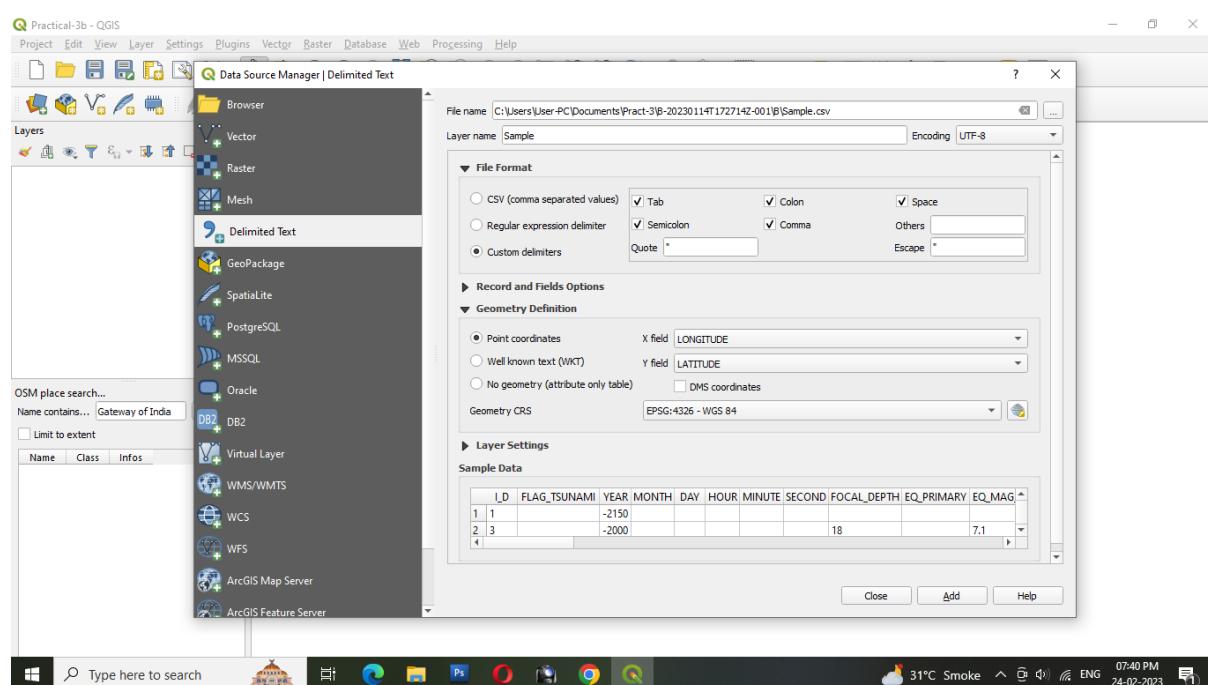
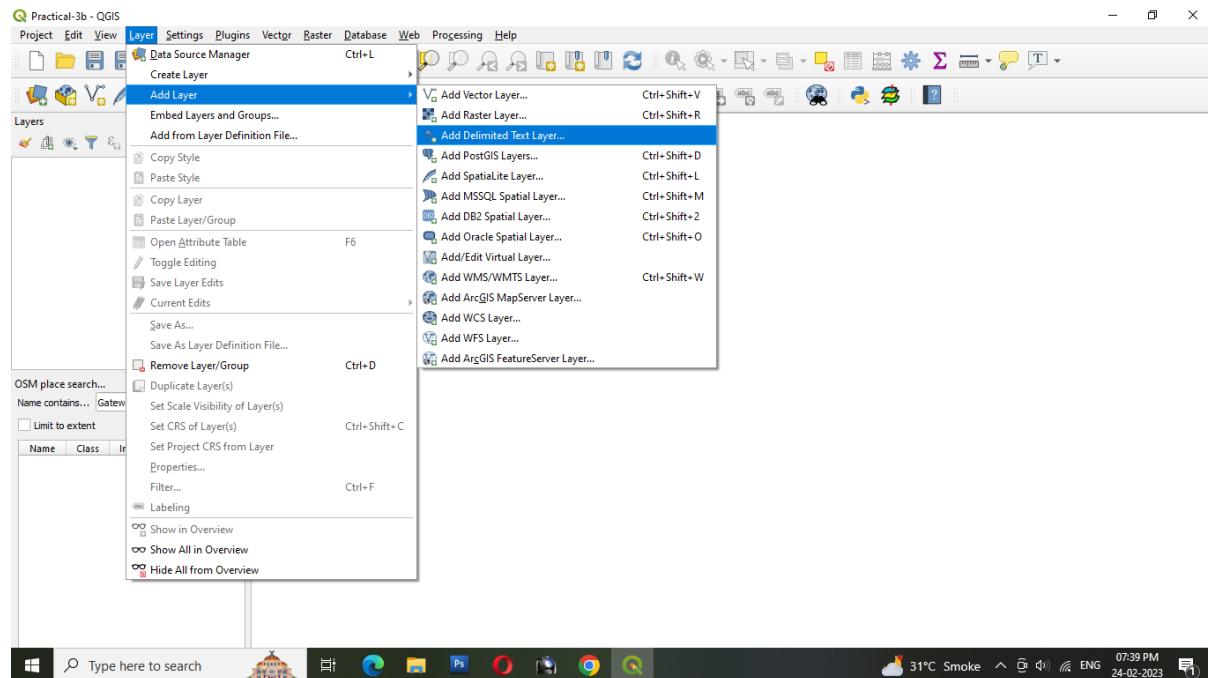
3(B) Making a map using vector data

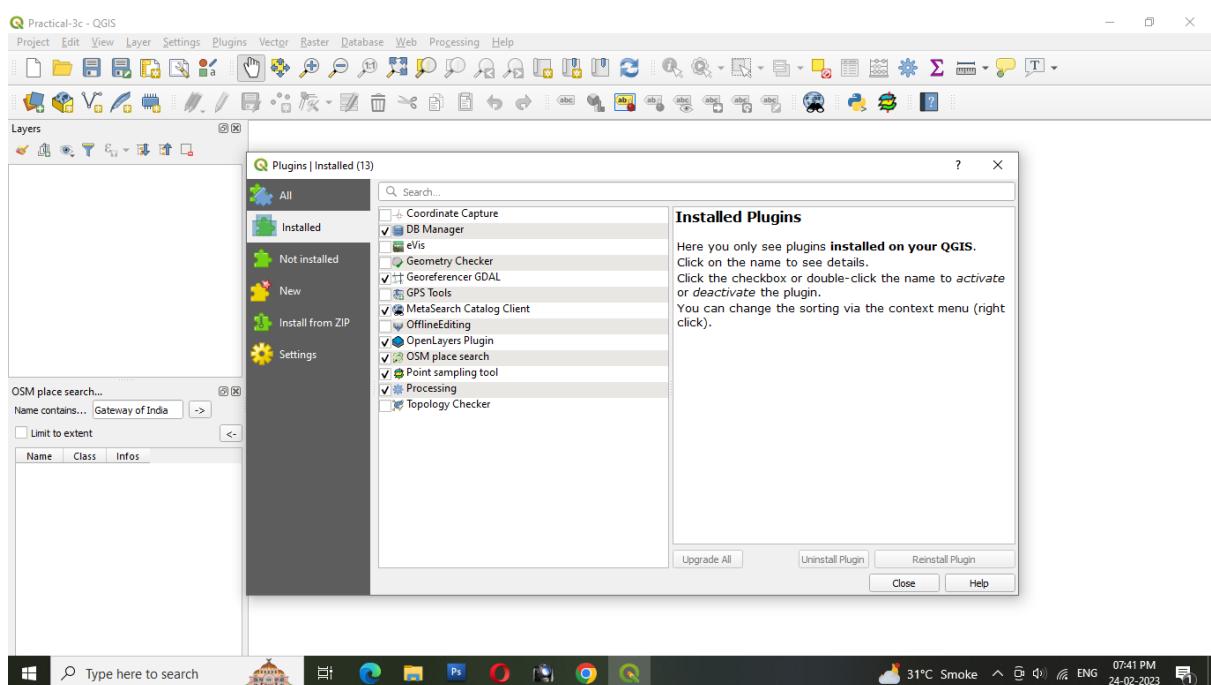
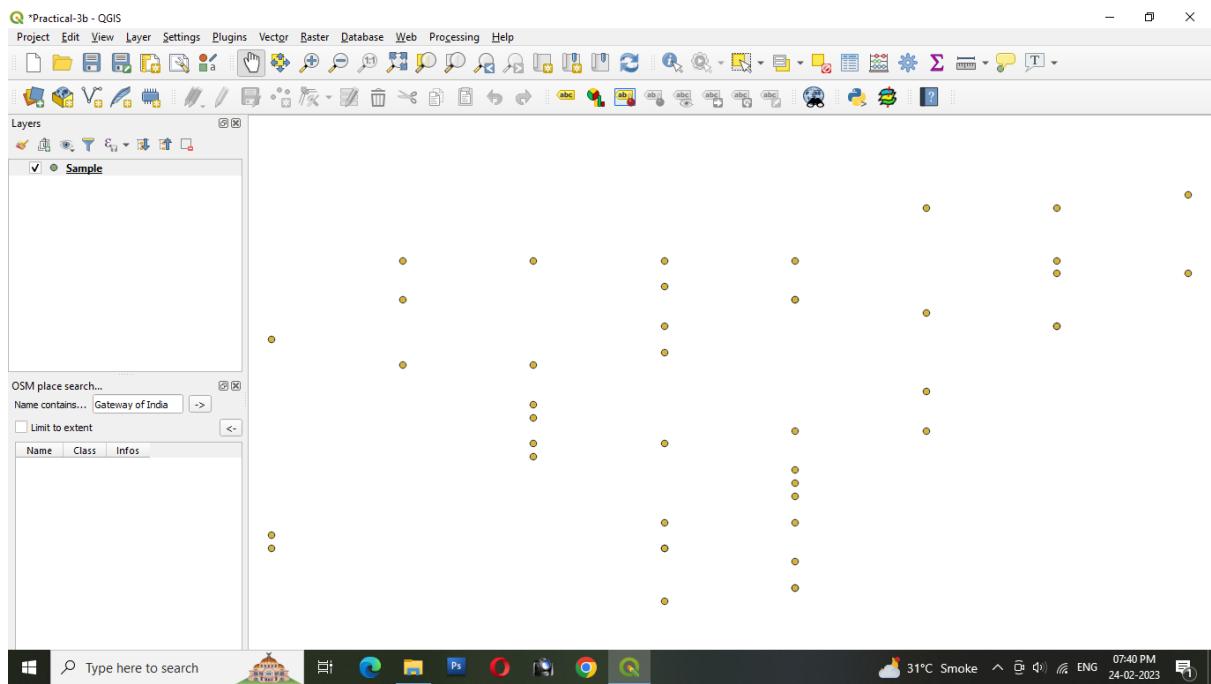


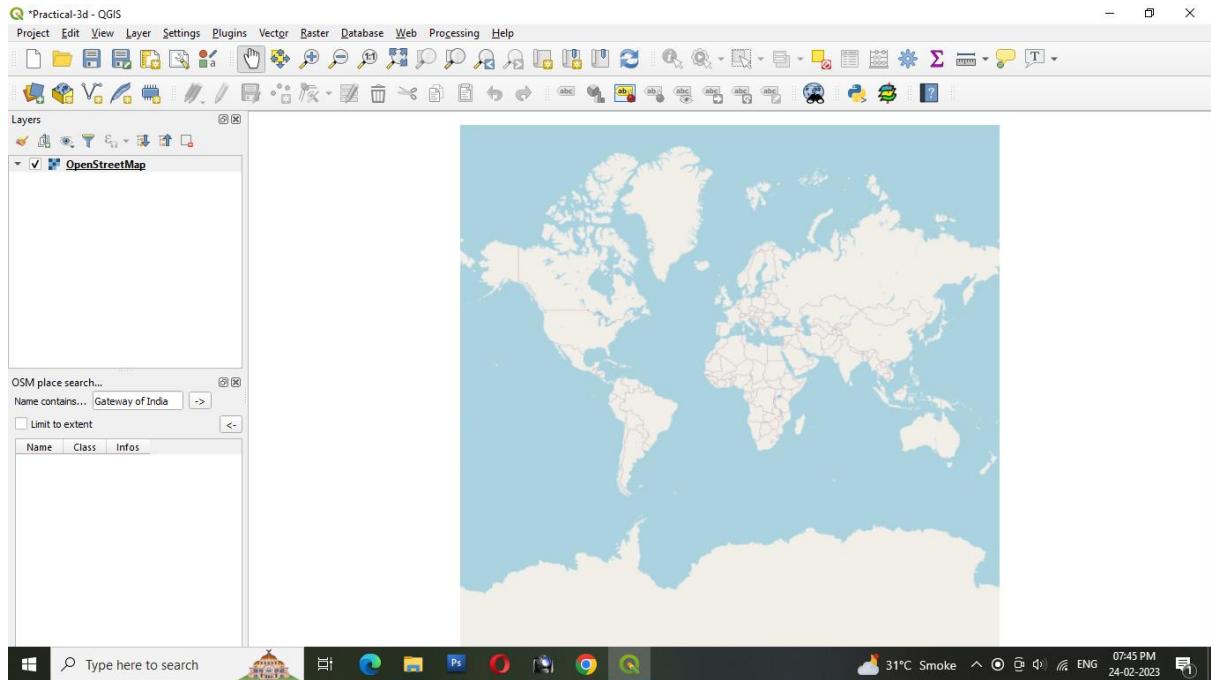
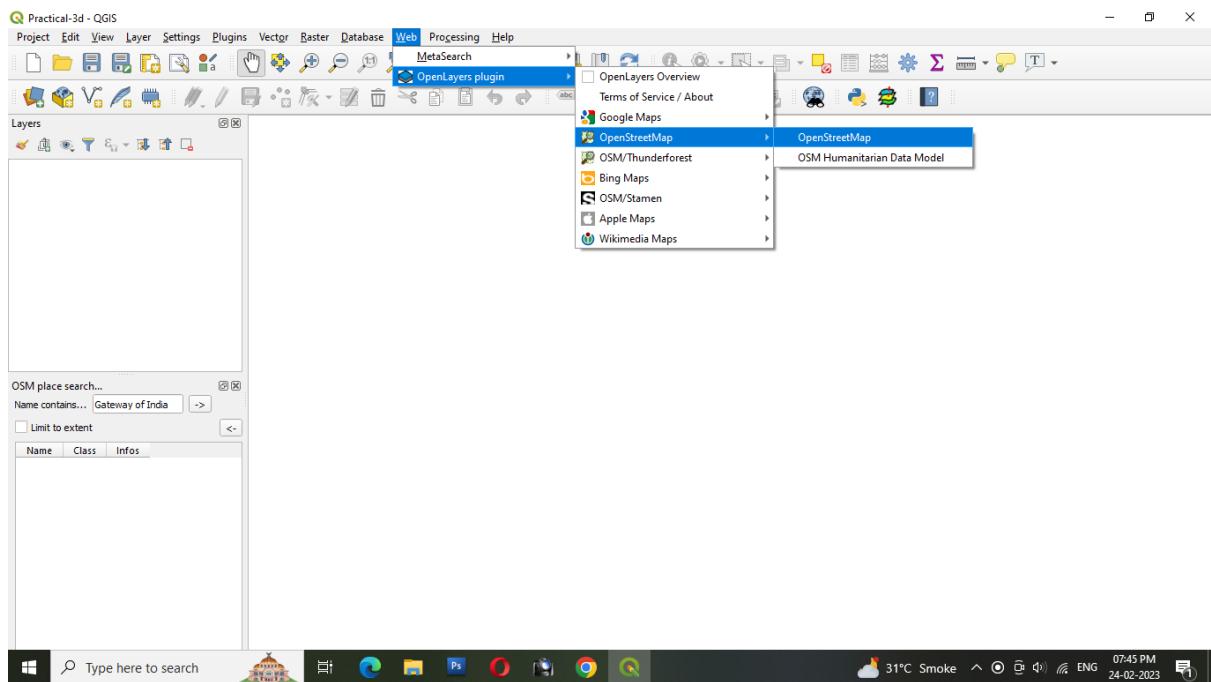


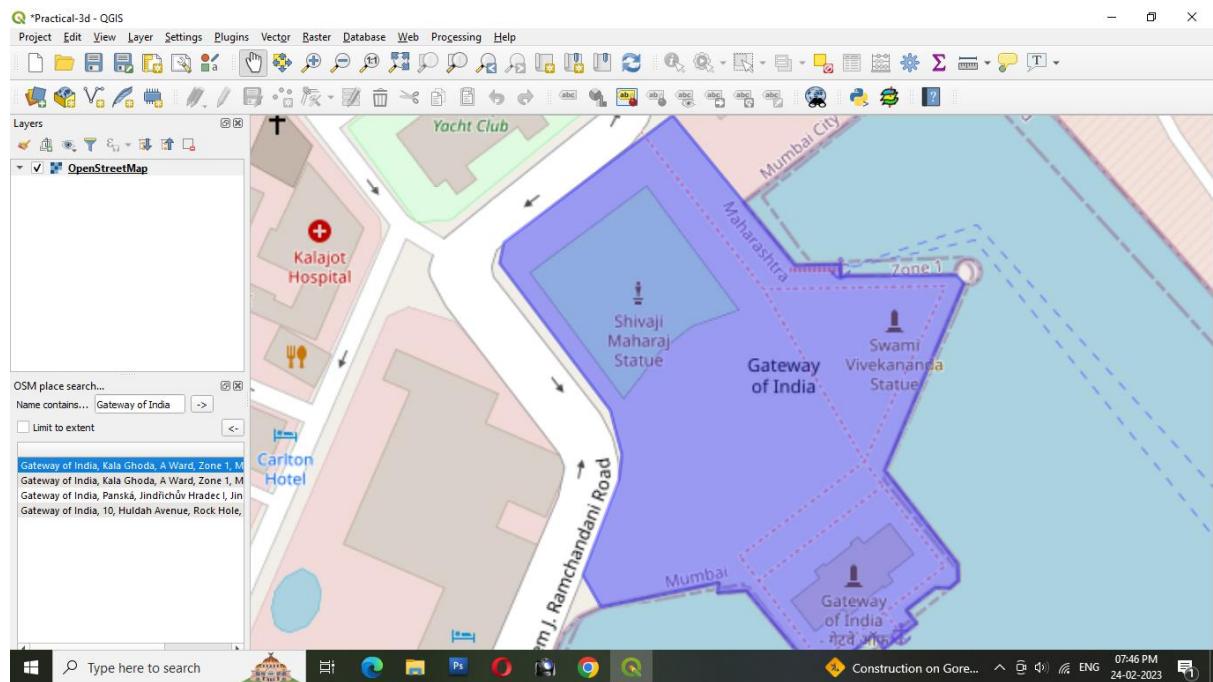


3(C) Importing Spreadsheets or CSV files



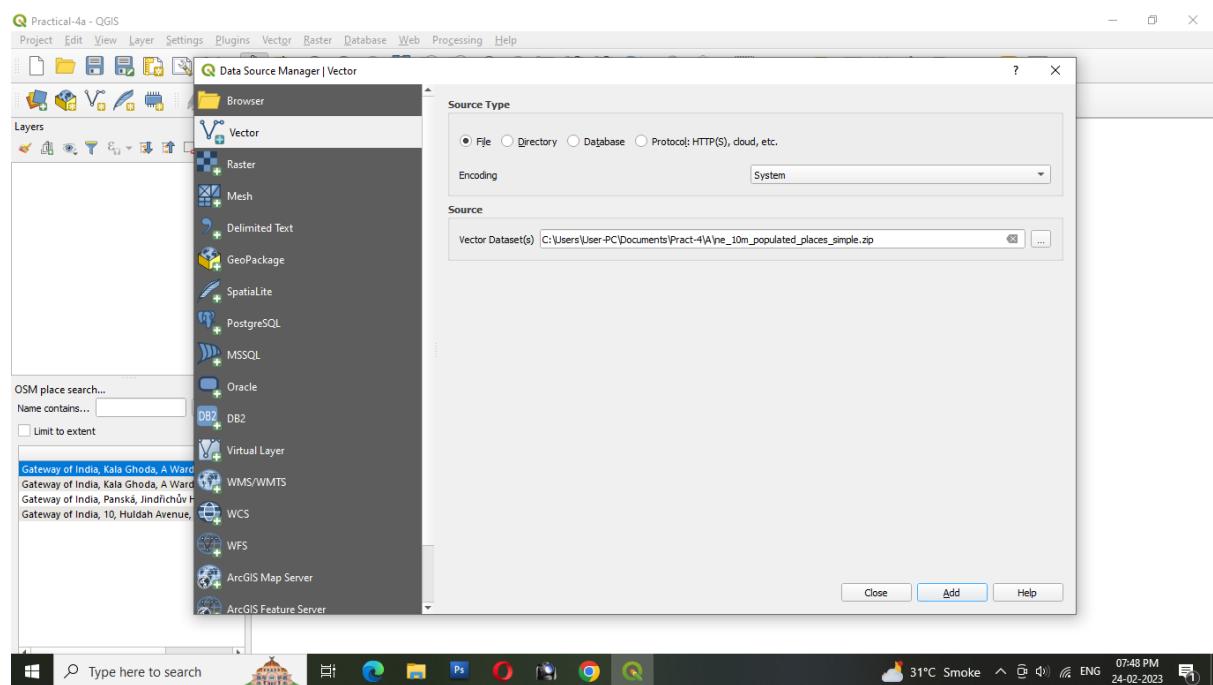
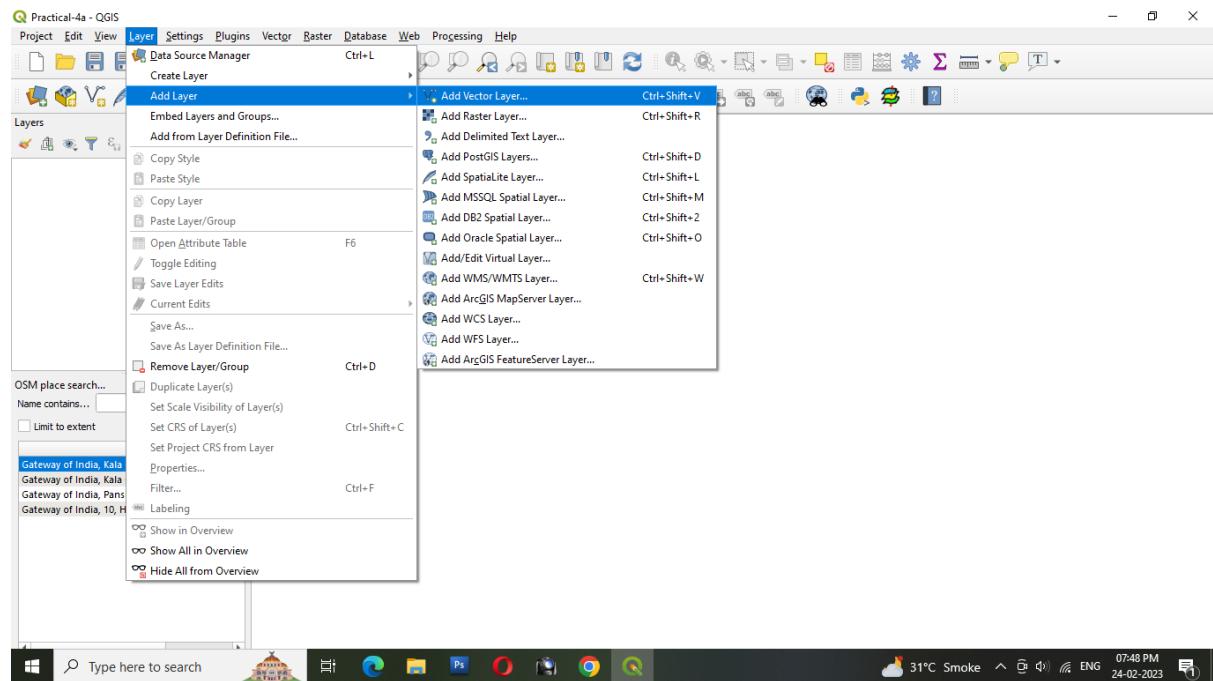


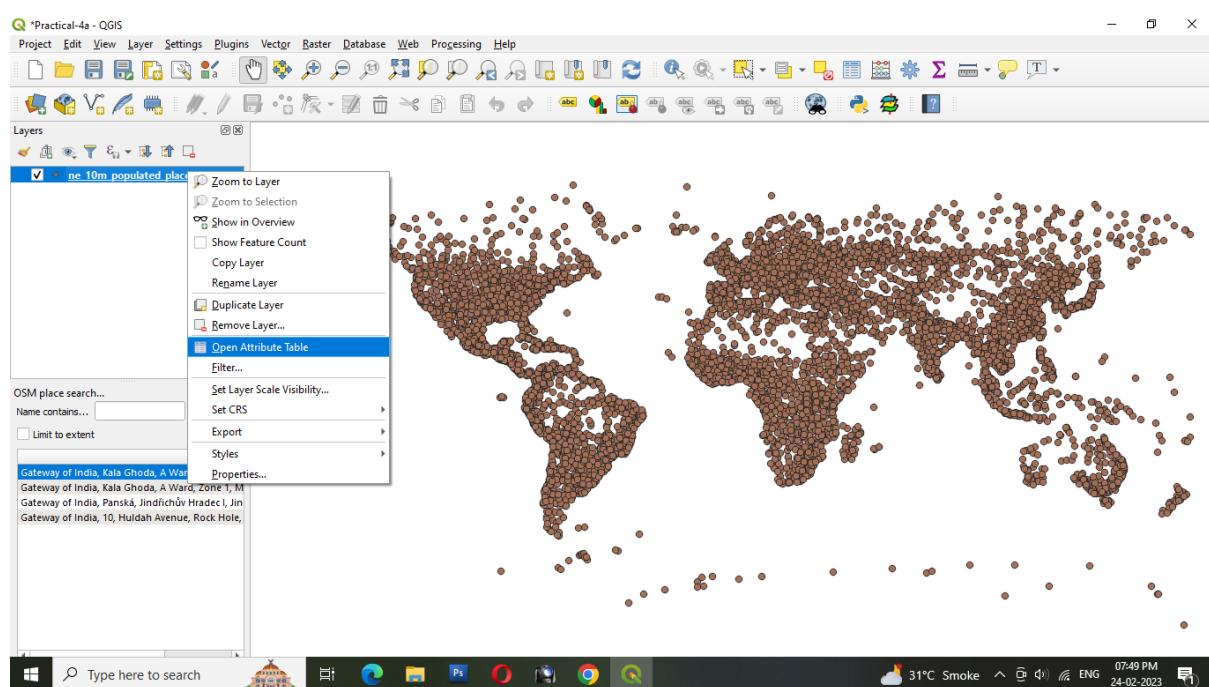
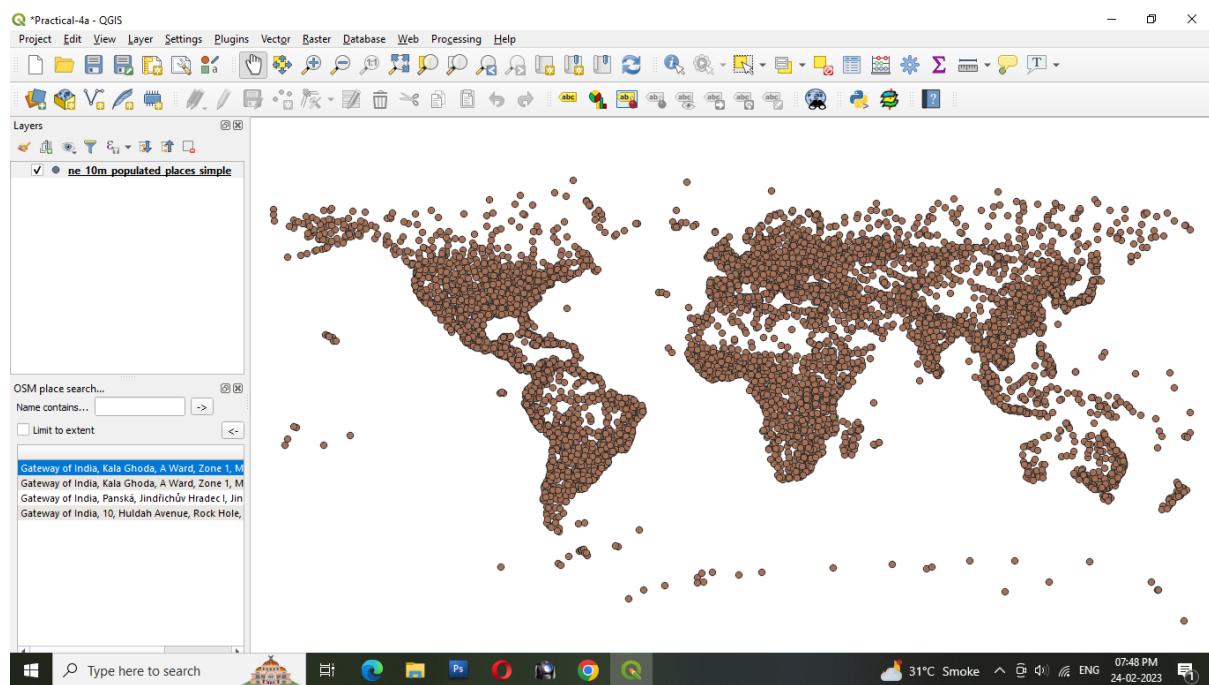




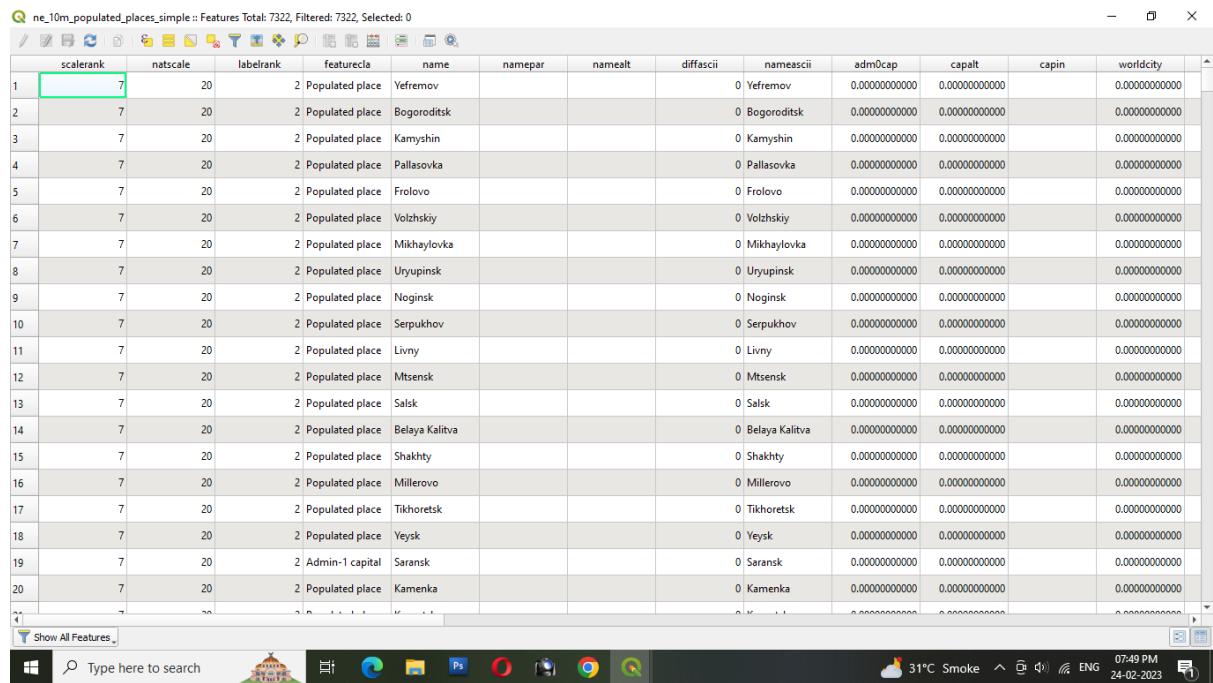
Practical 4: WORKING WITH ATTRIBUTES, TERRAIN DATA

4(A) Select feature in Vector layer





Q ne_10m_populated_places_simple :: Features Total: 7322, Filtered: 7322, Selected: 0



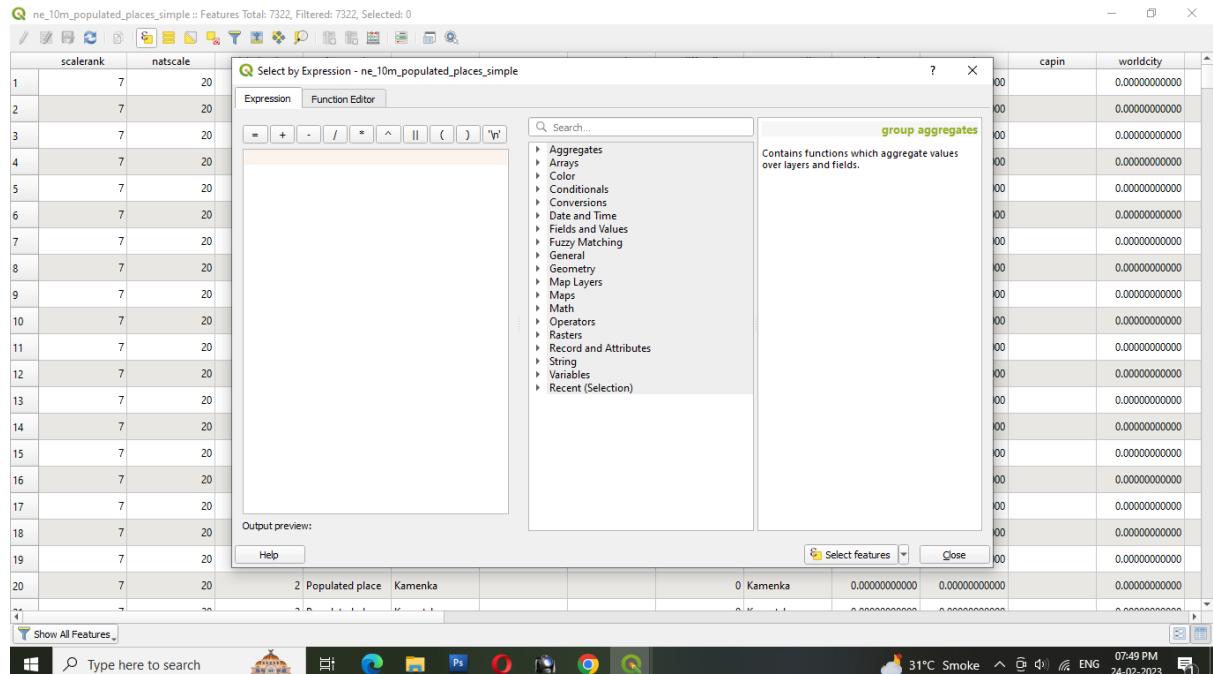
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1	7	20	2	Populated place	Yefremov			0	Yefremov	0.0000000000	0.0000000000		0.0000000000
2	7	20	2	Populated place	Bogoroditsk			0	Bogoroditsk	0.0000000000	0.0000000000		0.0000000000
3	7	20	2	Populated place	Kamyshin			0	Kamyshin	0.0000000000	0.0000000000		0.0000000000
4	7	20	2	Populated place	Pallasovka			0	Pallasovka	0.0000000000	0.0000000000		0.0000000000
5	7	20	2	Populated place	Frolovo			0	Frolovo	0.0000000000	0.0000000000		0.0000000000
6	7	20	2	Populated place	Volzhskiy			0	Volzhskiy	0.0000000000	0.0000000000		0.0000000000
7	7	20	2	Populated place	Mikhaylovka			0	Mikhaylovka	0.0000000000	0.0000000000		0.0000000000
8	7	20	2	Populated place	Uryupinsk			0	Uryupinsk	0.0000000000	0.0000000000		0.0000000000
9	7	20	2	Populated place	Noginsk			0	Noginsk	0.0000000000	0.0000000000		0.0000000000
10	7	20	2	Populated place	Serpukhov			0	Serpukhov	0.0000000000	0.0000000000		0.0000000000
11	7	20	2	Populated place	Livny			0	Livny	0.0000000000	0.0000000000		0.0000000000
12	7	20	2	Populated place	Mtsensk			0	Mtsensk	0.0000000000	0.0000000000		0.0000000000
13	7	20	2	Populated place	Salsk			0	Salsk	0.0000000000	0.0000000000		0.0000000000
14	7	20	2	Populated place	Belya Kalitva			0	Belya Kalitva	0.0000000000	0.0000000000		0.0000000000
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16	7	20	2	Populated place	Millerovo			0	Millerovo	0.0000000000	0.0000000000		0.0000000000
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18	7	20	2	Populated place	Yeysk			0	Yeysk	0.0000000000	0.0000000000		0.0000000000
19	7	20	2	Admin-1 capital	Saransk			0	Saransk	0.0000000000	0.0000000000		0.0000000000
20	7	20	2	Populated place	Kamenka			0	Kamenka	0.0000000000	0.0000000000		0.0000000000

Show All Features

Windows Taskbar: Type here to search, File Explorer, Edge, FileZilla, Photoshop, Firefox, Chrome, QGIS

System tray: 31°C Smoke, ENG, 07:49 PM, 24-02-2023

Q ne_10m_populated_places_simple :: Features Total: 7322, Filtered: 7322, Selected: 0



Select by Expression - ne_10m_populated_places_simple

Expression Function Editor

Search... group aggregates

Contains functions which aggregate values over layers and fields.

Output preview:

scalerank	natscale	featurecla	name	namepar	namealt	diffascii	nameascii	adm0cap	capalt	capin	worldcity
20	7	2	Populated place	Kamenka		0	Kamenka	0.0000000000	0.0000000000		0.0000000000

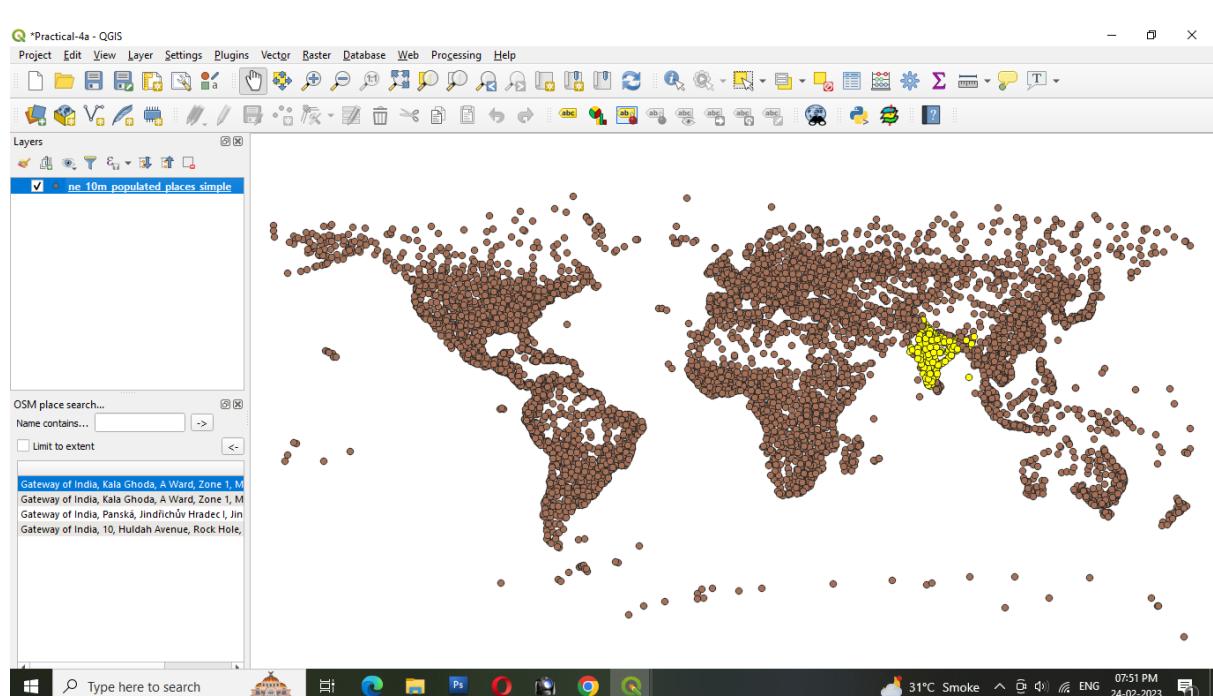
Show All Features

Windows Taskbar: Type here to search, File Explorer, Edge, FileZilla, Photoshop, Firefox, Chrome, QGIS

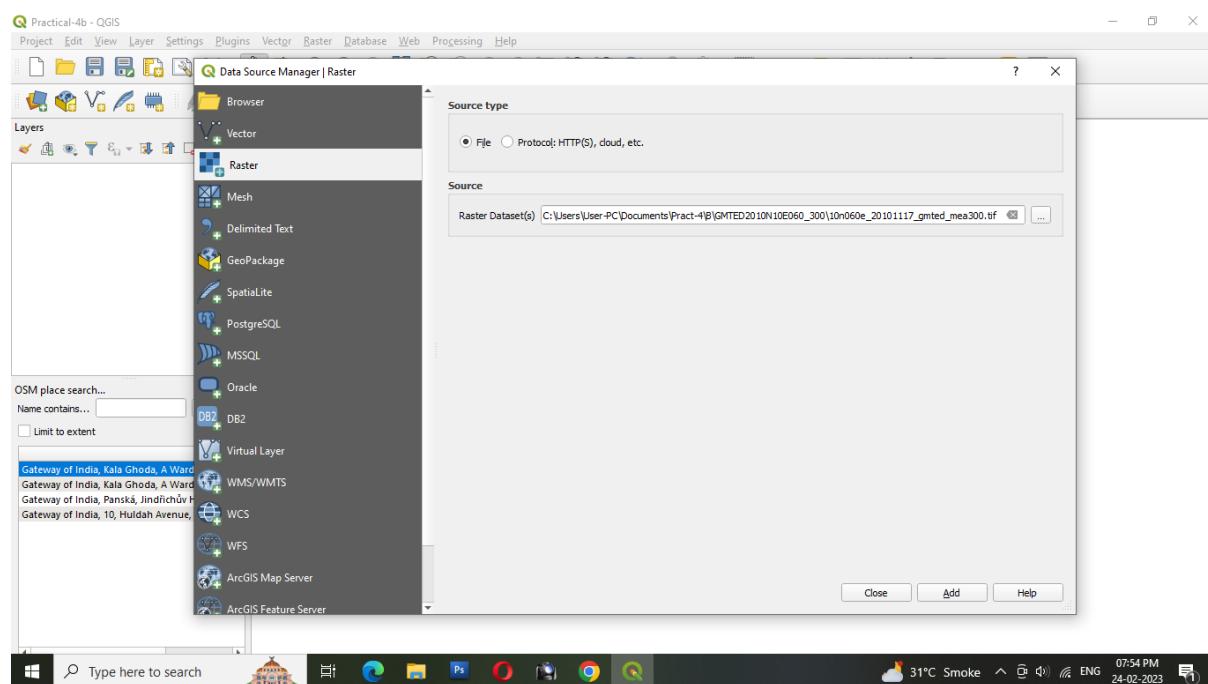
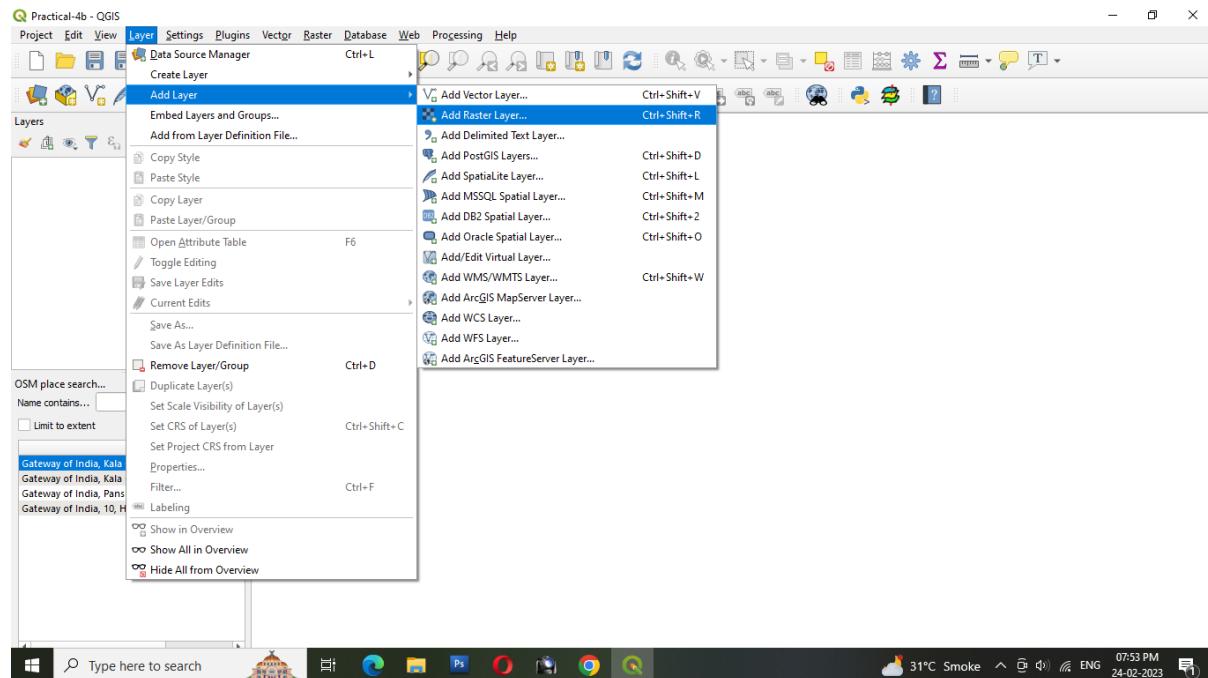
System tray: 31°C Smoke, ENG, 07:49 PM, 24-02-2023

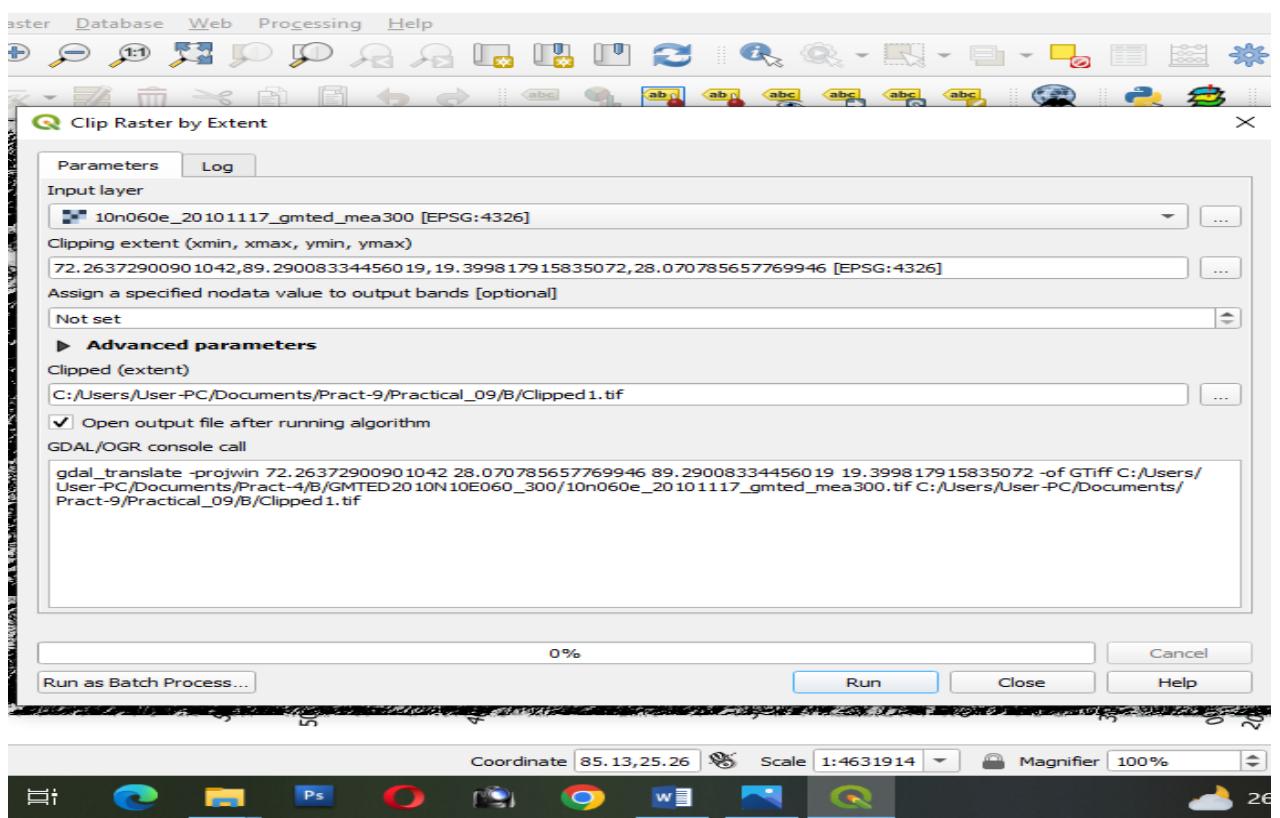
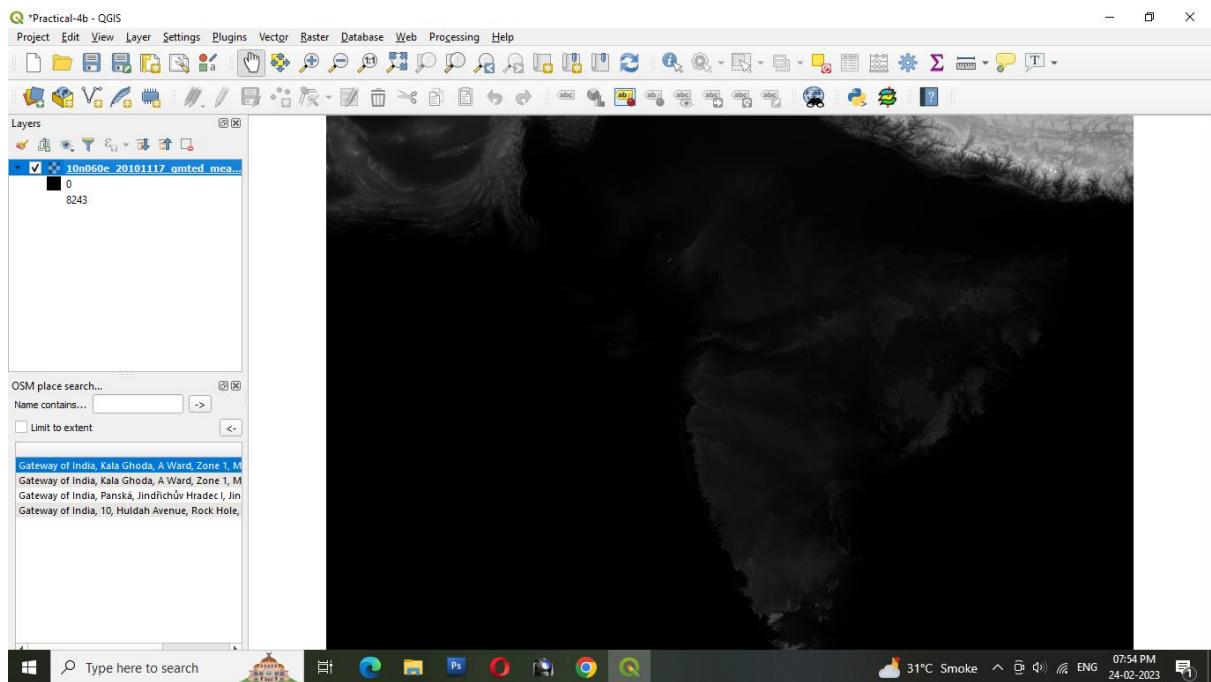
Q ne_10m_populated_places_simple :: Features Total: 7322, Filtered: 7322, Selected: 6080

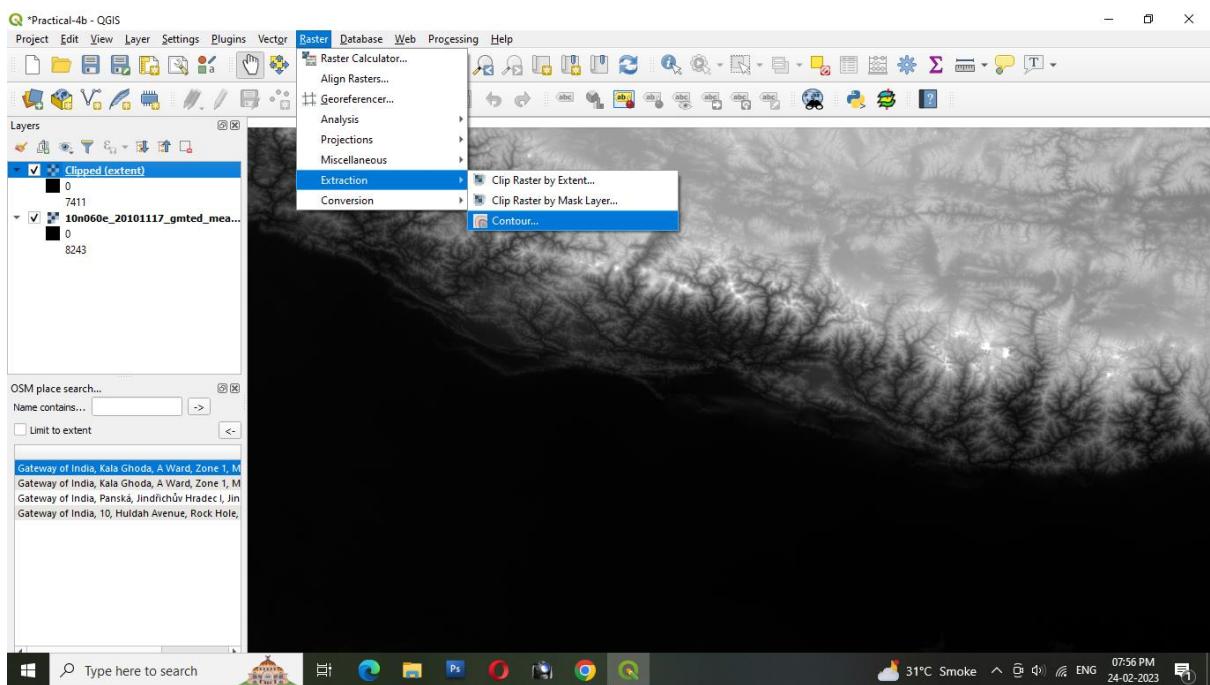
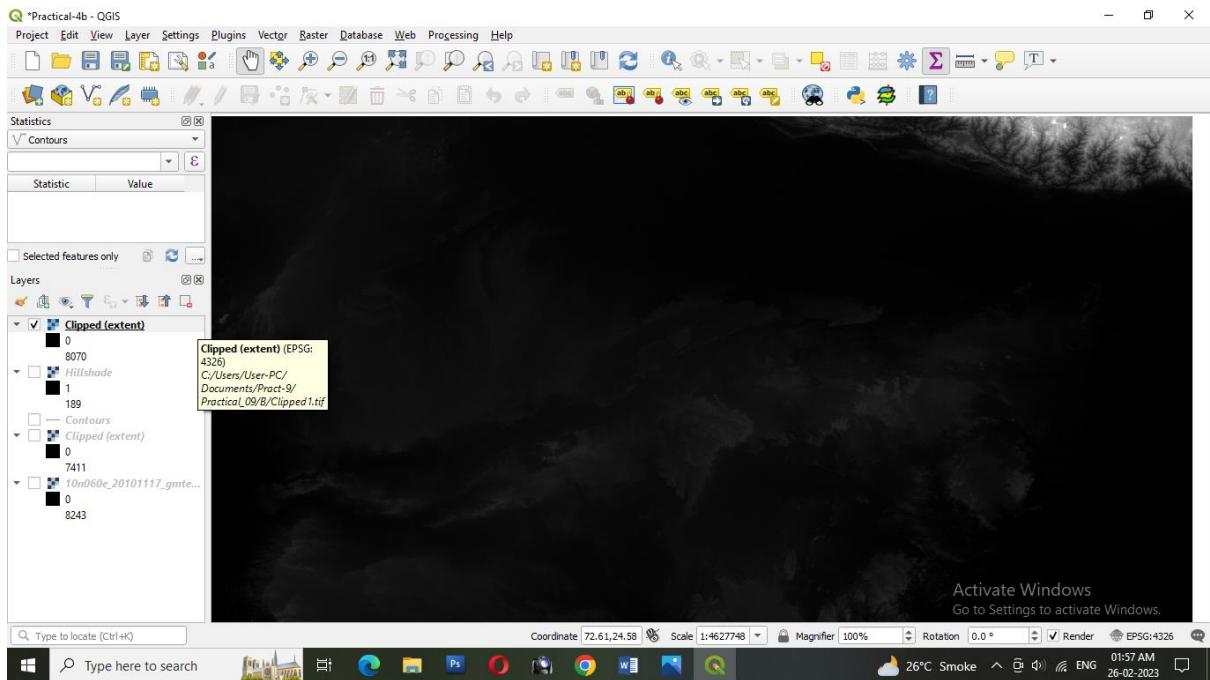
	scalerank	natscale	labelrank	featurecla	name	namepar	namealt	diffascii	nameascii	adm0cap	capalt	capin	worldcity
64	7	20	2	Populated place	Sosnogorsk			0	Sosnogorsk	0.0000000000	0.0000000000		0.0000000000
65	7	20	6	Populated place	Matola			0	Matola	0.0000000000	0.0000000000		0.0000000000
66	7	20	8	Populated place	Lata			0	Lata	0.0000000000	0.0000000000		0.0000000000
67	7	20	2	Populated place	Timiryazevskiy			0	Timiryazevskiy	0.0000000000	0.0000000000		0.0000000000
68	7	20	2	Populated place	Asino			0	Asino	0.0000000000	0.0000000000		0.0000000000
69	7	20	2	Populated place	Strezhevoy			0	Strezhevoy	0.0000000000	0.0000000000		0.0000000000
70	7	20	2	Admin-1 capital	Cherkessk			0	Cherkessk	0.0000000000	0.0000000000		0.0000000000
71	7	20	2	Admin-1 capital	Vladikavkaz			0	Vladikavkaz	0.0000000000	0.0000000000		0.0000000000
72	7	20	2	Populated place	Blagodarnyy			0	Blagodarnyy	0.0000000000	0.0000000000		0.0000000000
73	7	20	6	Populated place	Vilanculos			0	Vilanculos	0.0000000000	0.0000000000		0.0000000000
74	7	20	3	Populated place	Cradock			0	Cradock	0.0000000000	0.0000000000		0.0000000000
75	7	20	3	Populated place	Uitenhage			0	Uitenhage	0.0000000000	0.0000000000		0.0000000000
76	7	20	3	Populated place	Port Alfred			0	Port Alfred	0.0000000000	0.0000000000		0.0000000000
77	7	20	3	Populated place	Grahamstown			0	Grahamstown	0.0000000000	0.0000000000		0.0000000000
78	7	20	3	Populated place	Port St. Johns			0	Port St. Johns	0.0000000000	0.0000000000		0.0000000000
79	7	20	3	Populated place	Aliwal North			0	Aliwal North	0.0000000000	0.0000000000		0.0000000000
80	7	20	3	Populated place	Queenstown			0	Queenstown	0.0000000000	0.0000000000		0.0000000000
81	7	20	2	Populated place	Egvekinot			0	Egvekinot	0.0000000000	0.0000000000		0.0000000000
82	7	20	2	Populated place	Sovetsk			0	Sovetsk	0.0000000000	0.0000000000		0.0000000000
83	7	20	2	Populated place	Nikel			0	Nikel	0.0000000000	0.0000000000		0.0000000000

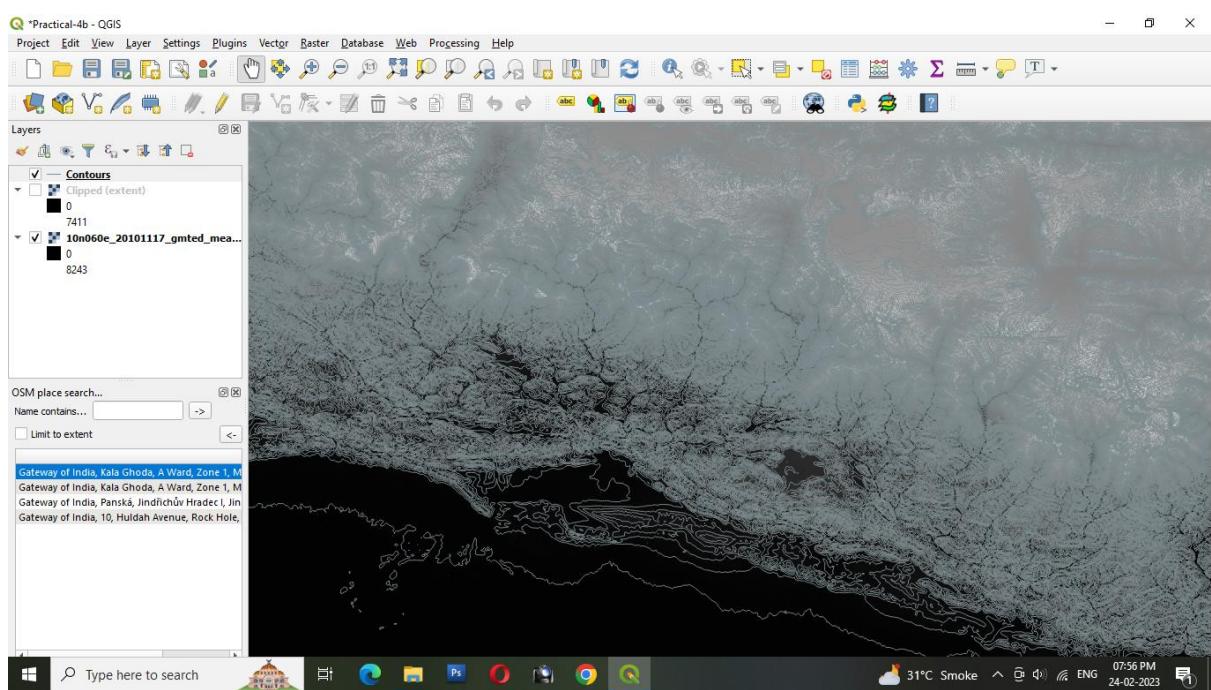
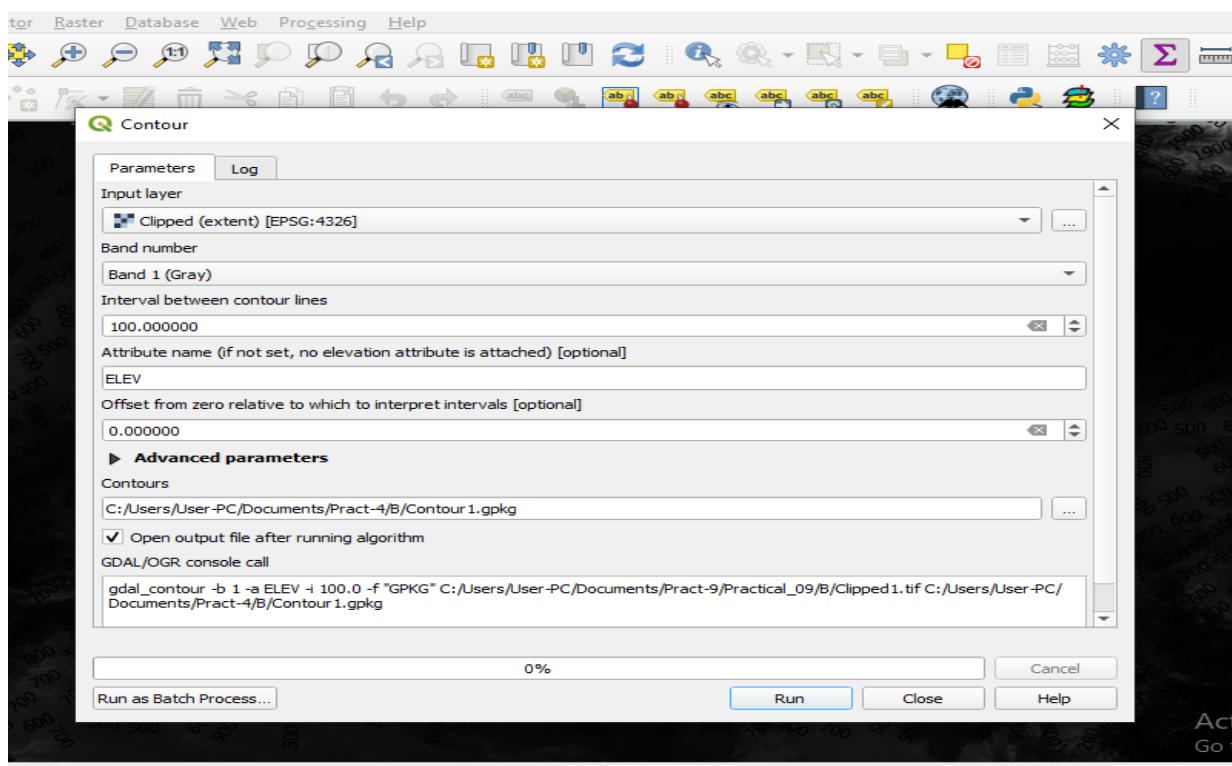


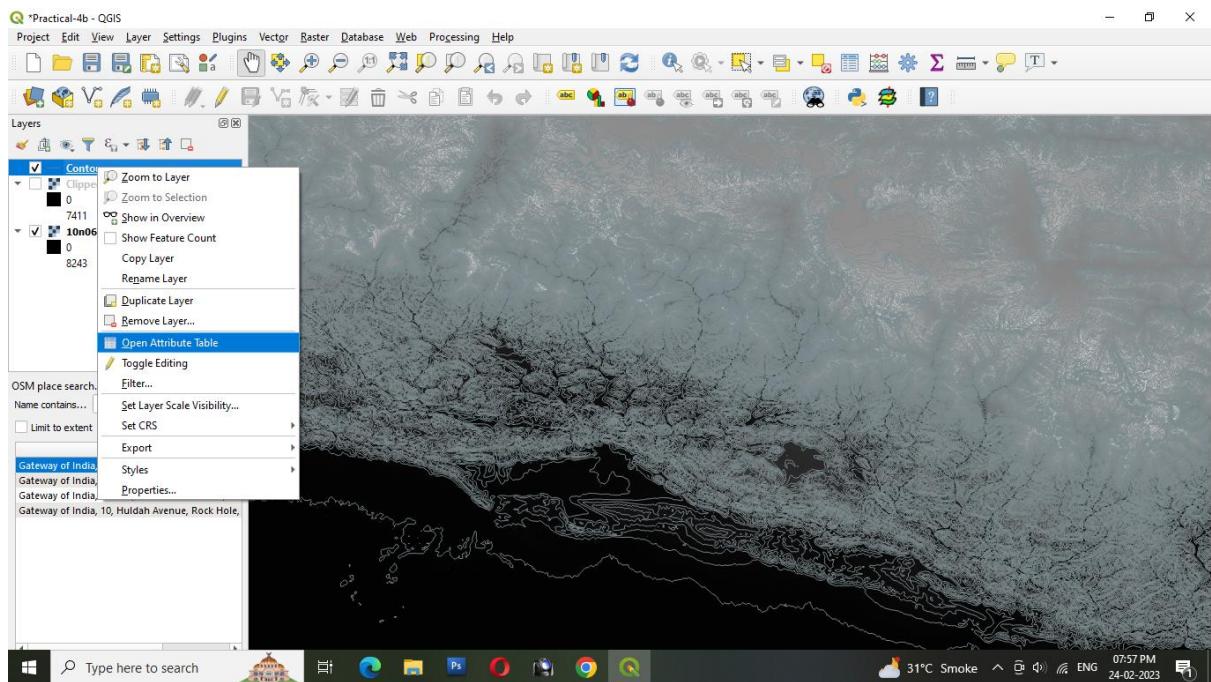
4(B) Terrain Data & Hill Shade





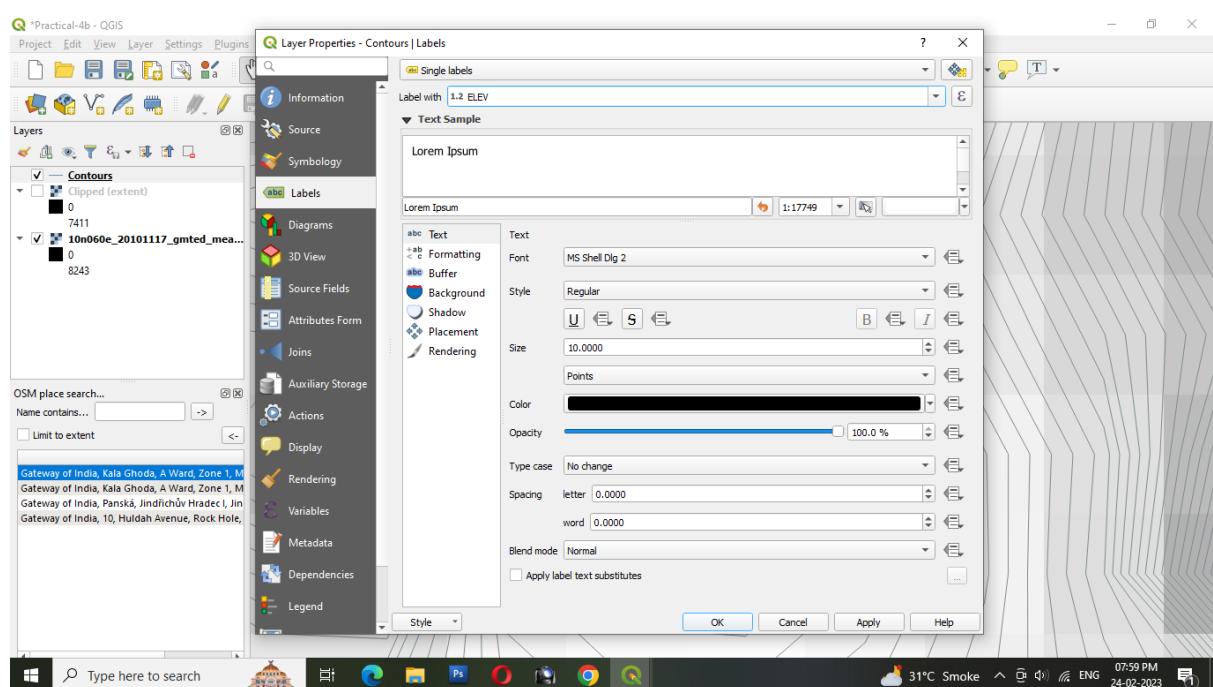
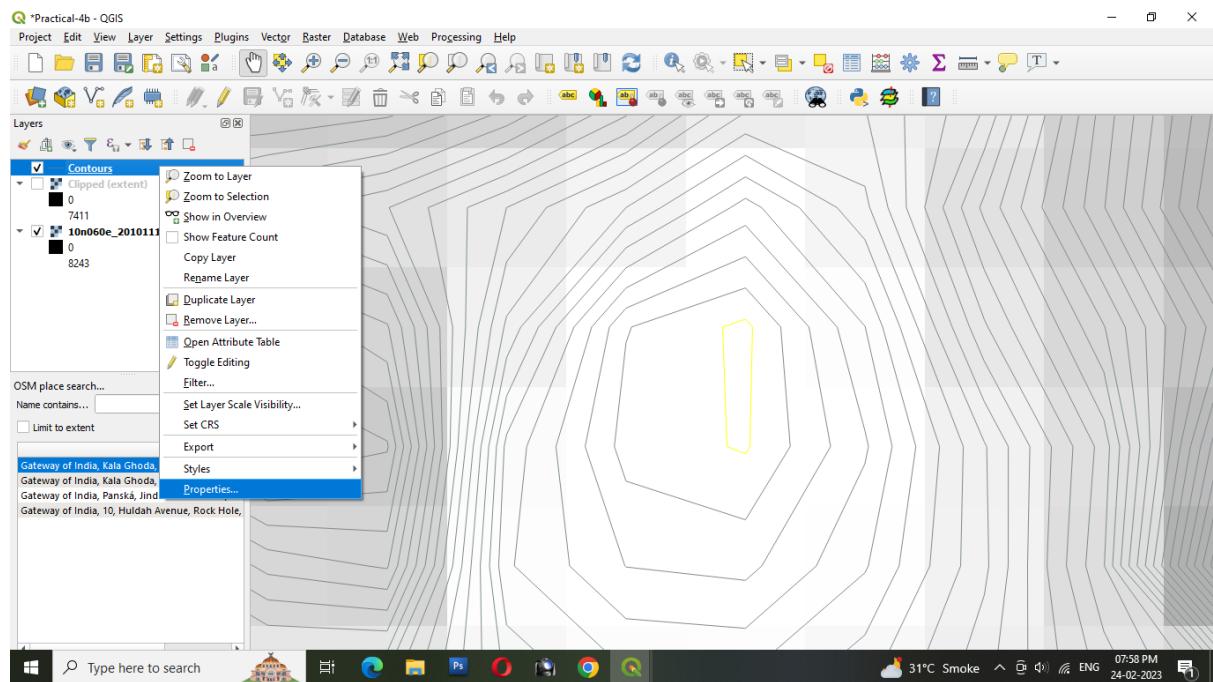


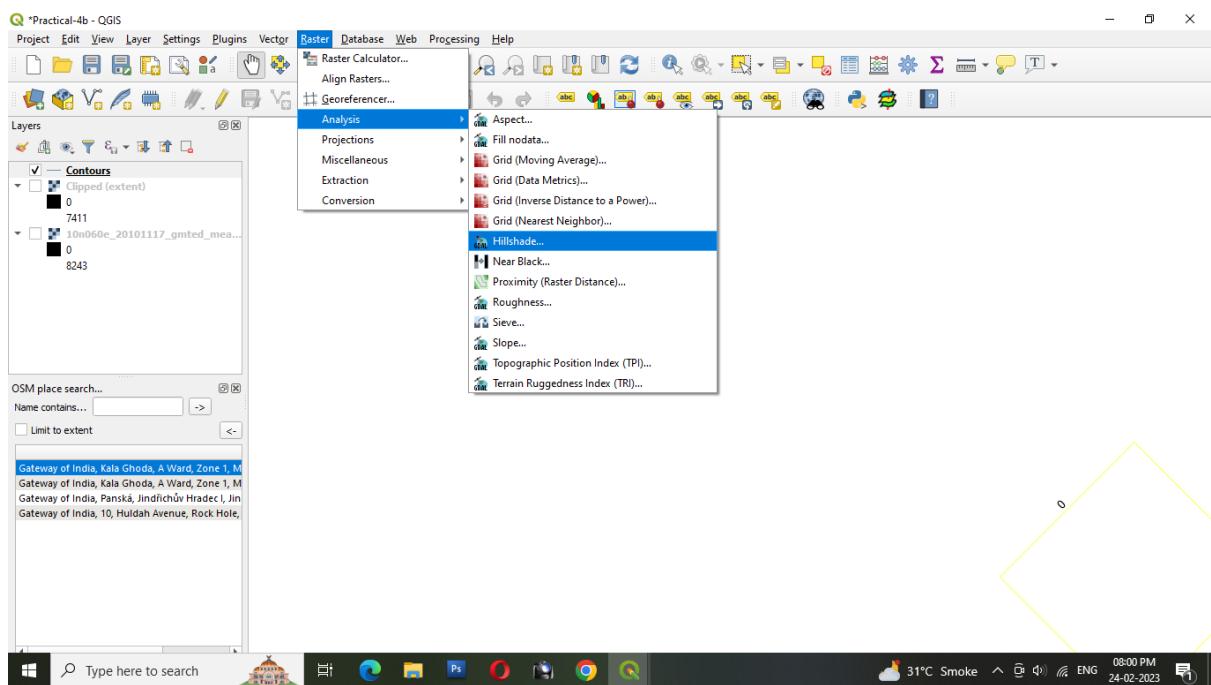
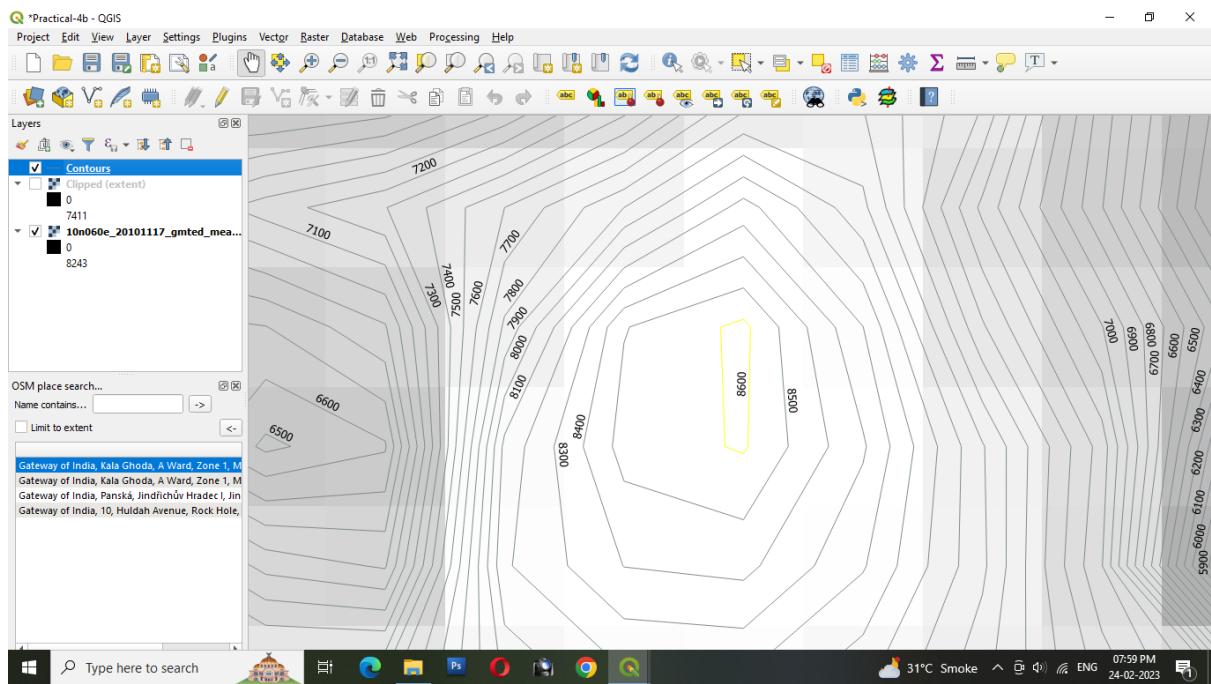


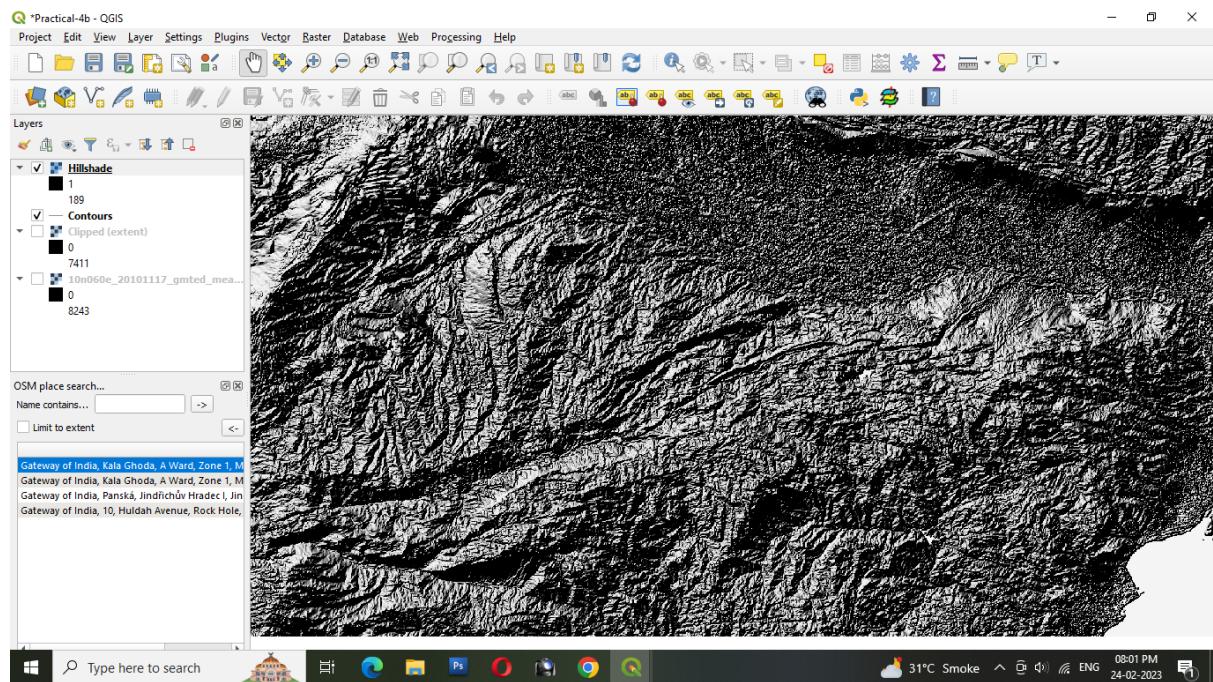


The screenshot shows the QGIS attribute table for the 'Contours' layer. The table has two columns: 'ID' and 'ELEV'. The data is as follows:

ID	ELEV
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	7
9	8
10	9
11	10
12	11
13	12
14	13
15	14
16	15
17	16
18	17
19	18
20	19
21	20

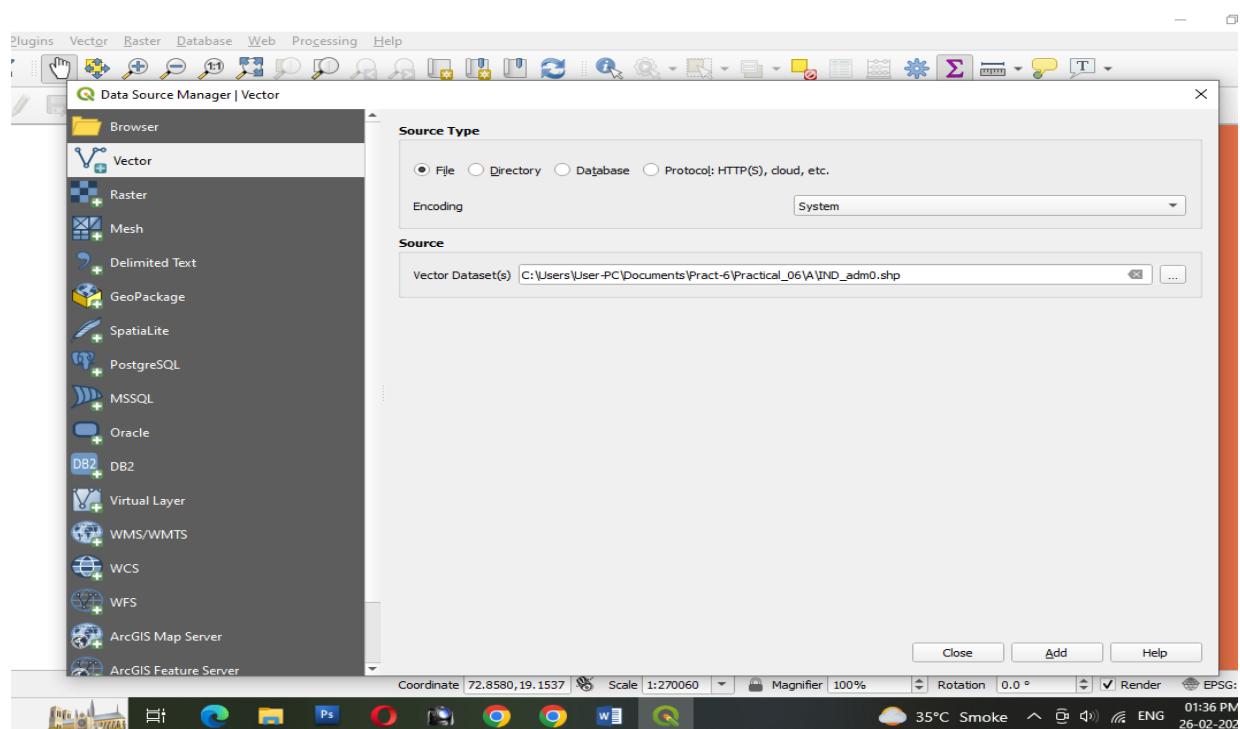
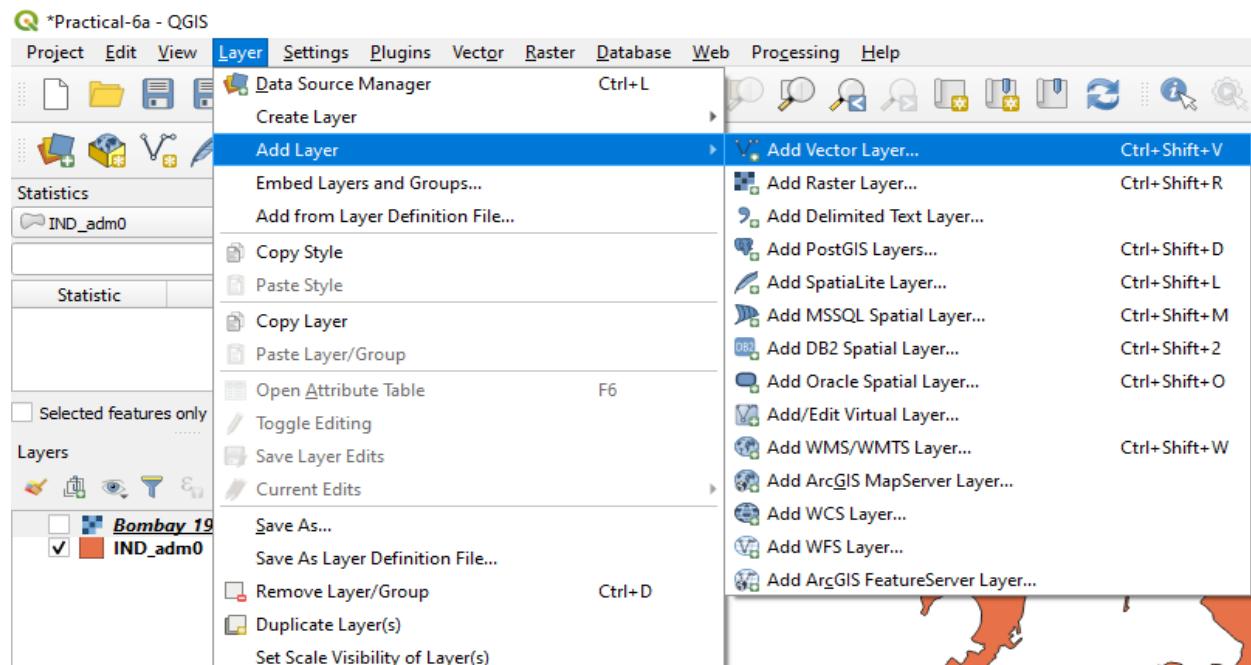


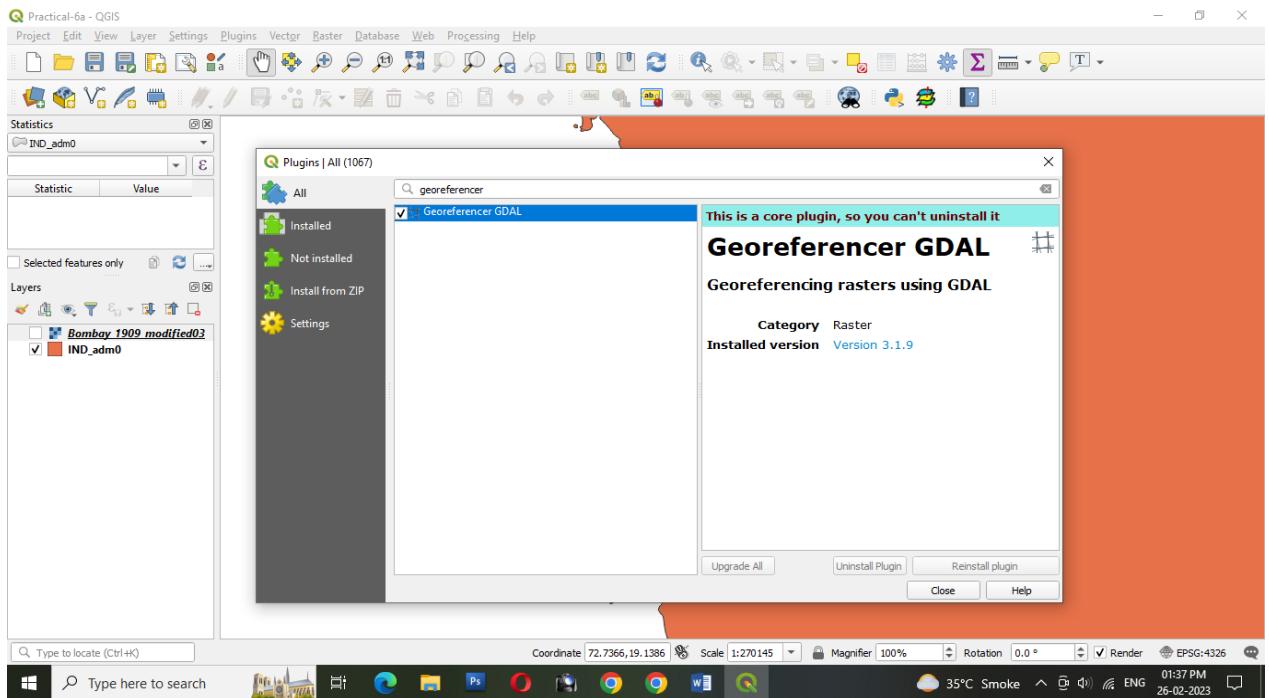
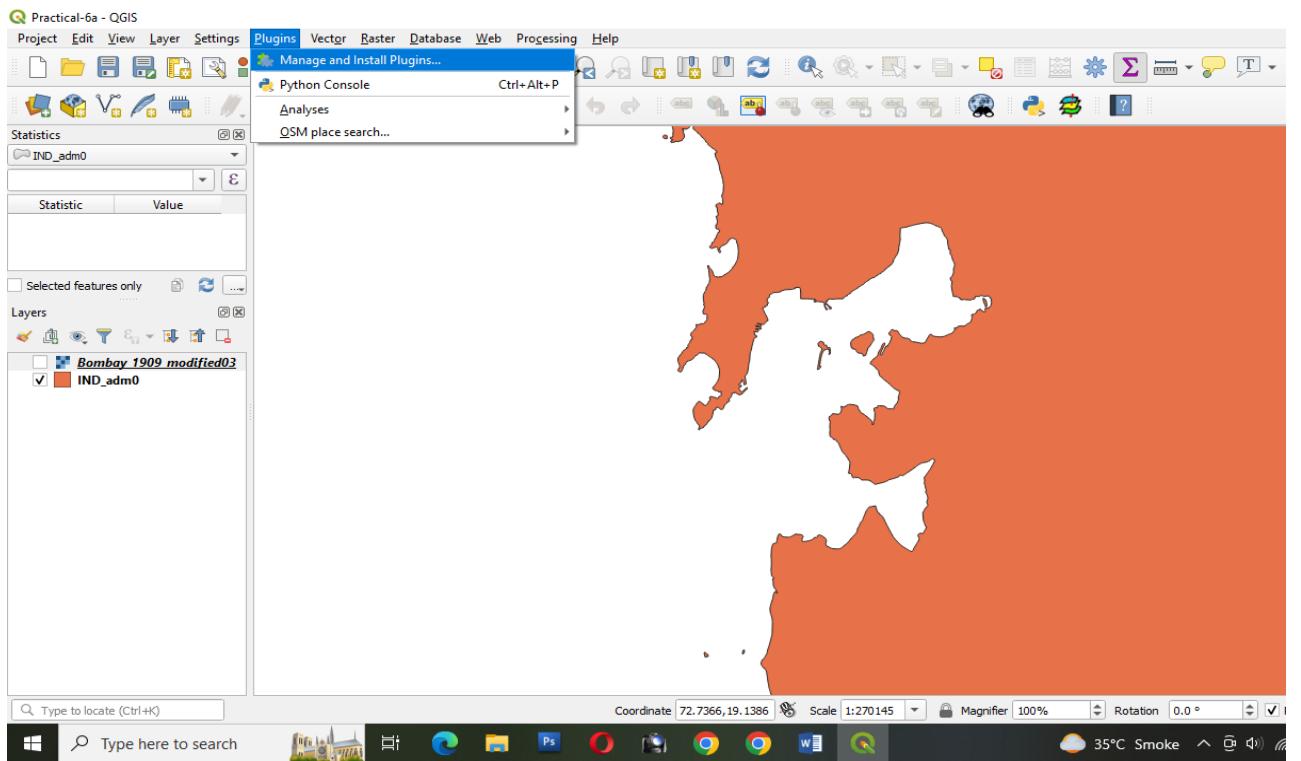


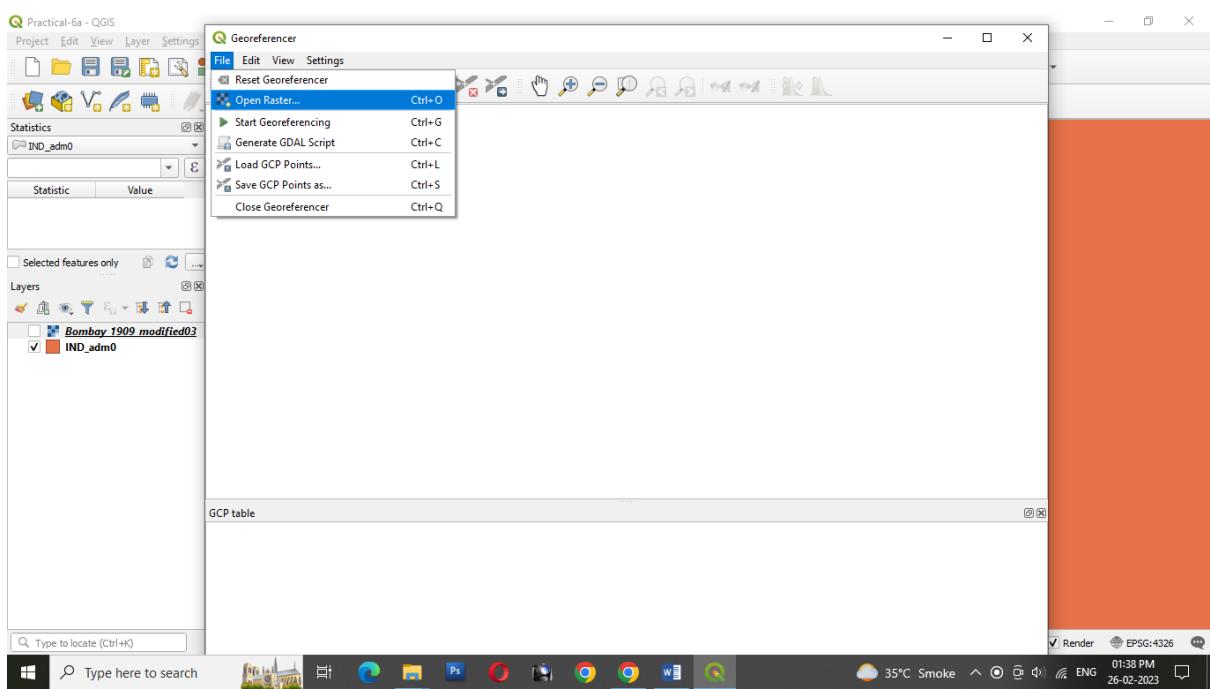
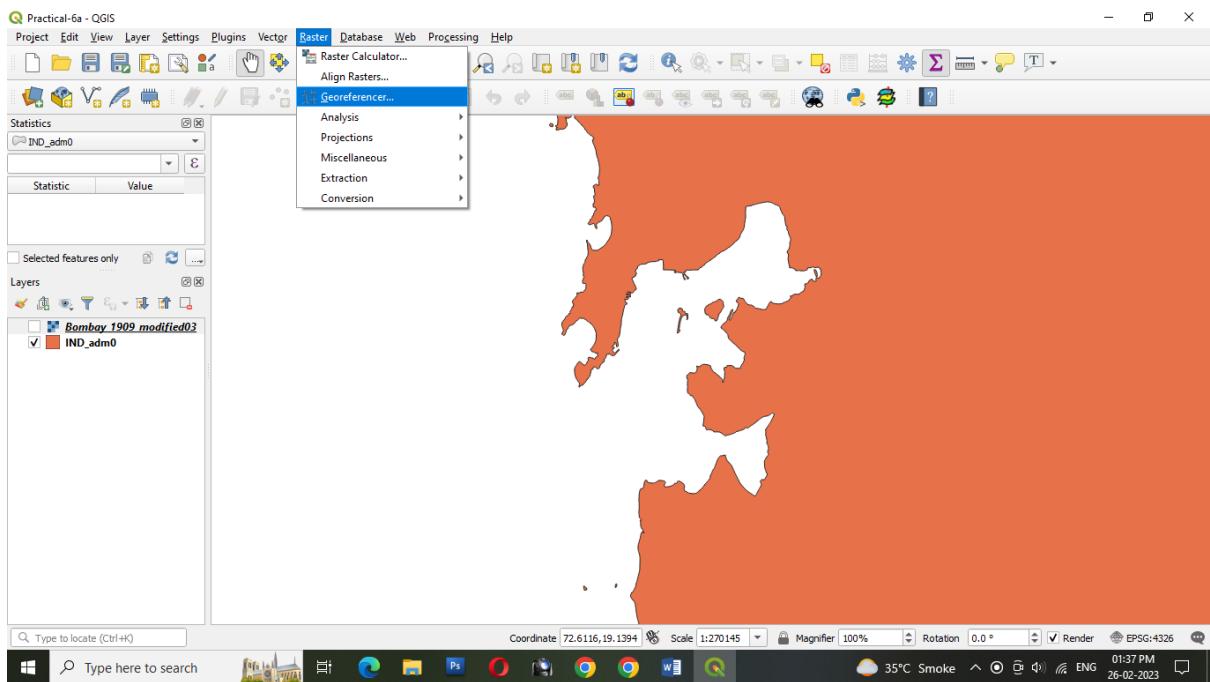


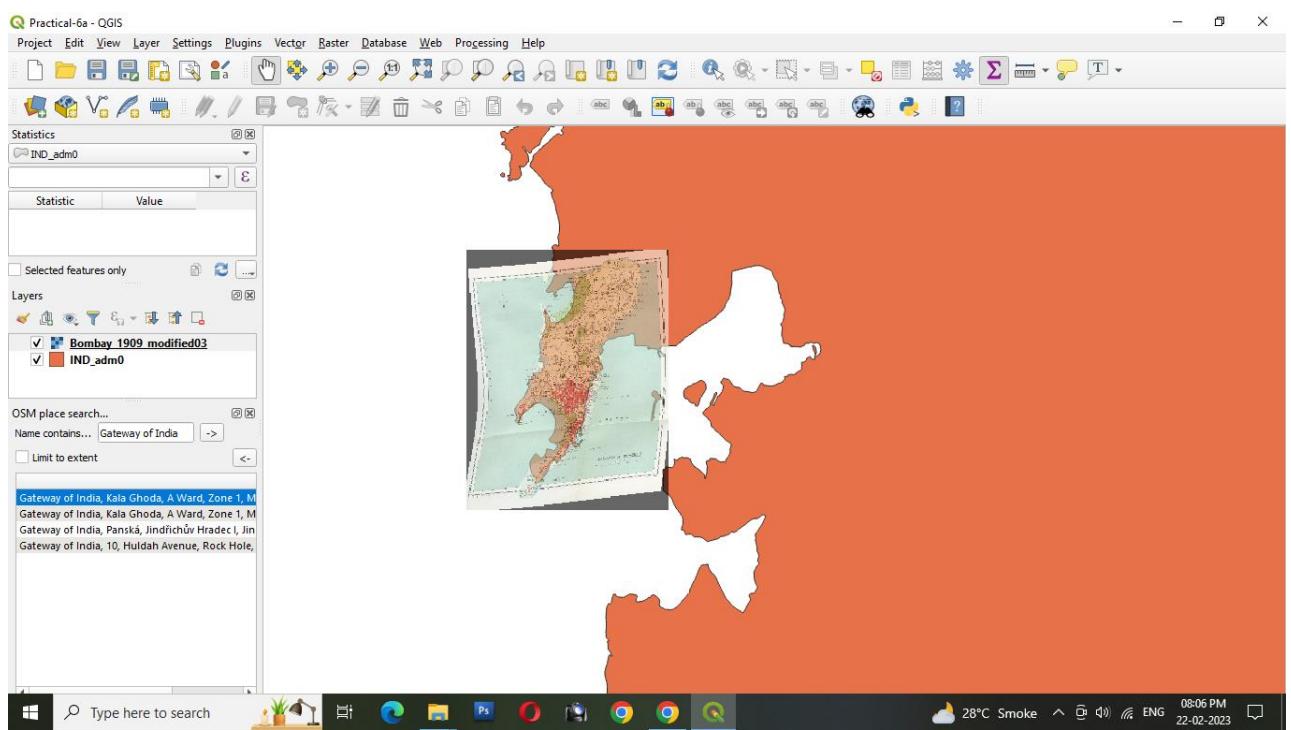
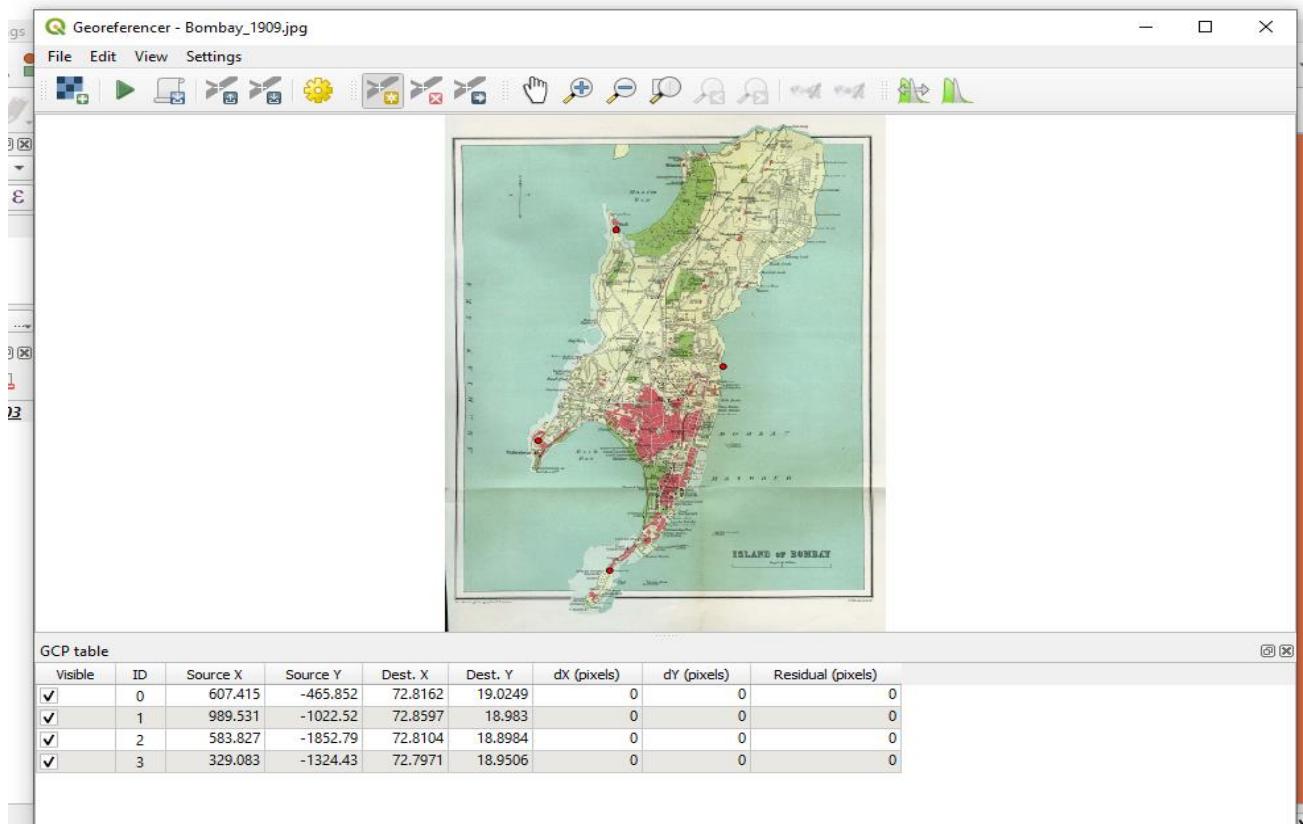
Practical 5: GEOREFERENCING

5(A) Georeferencing Topo Sheets and Scanned Maps

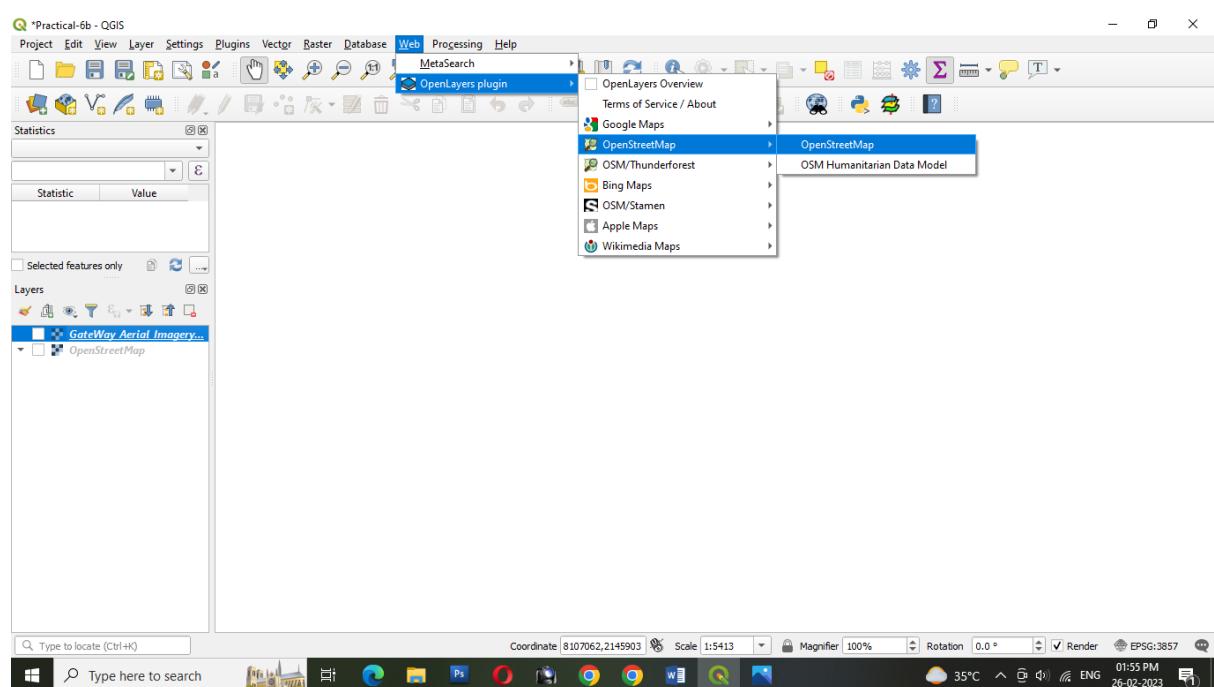
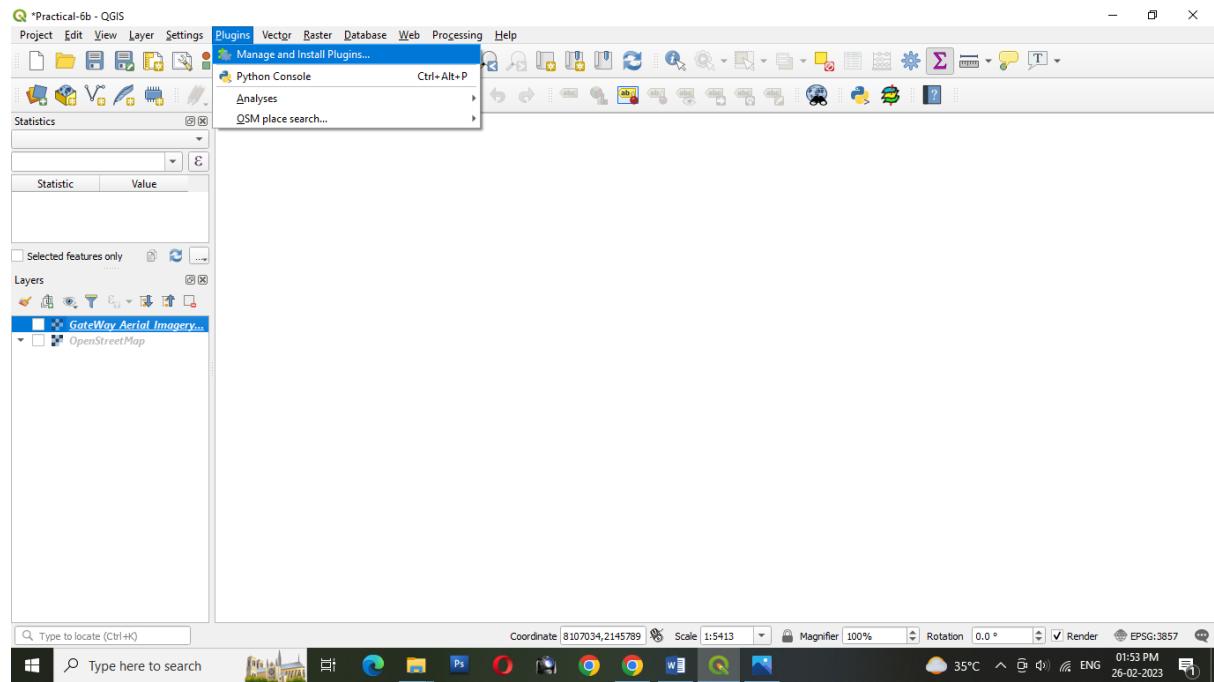


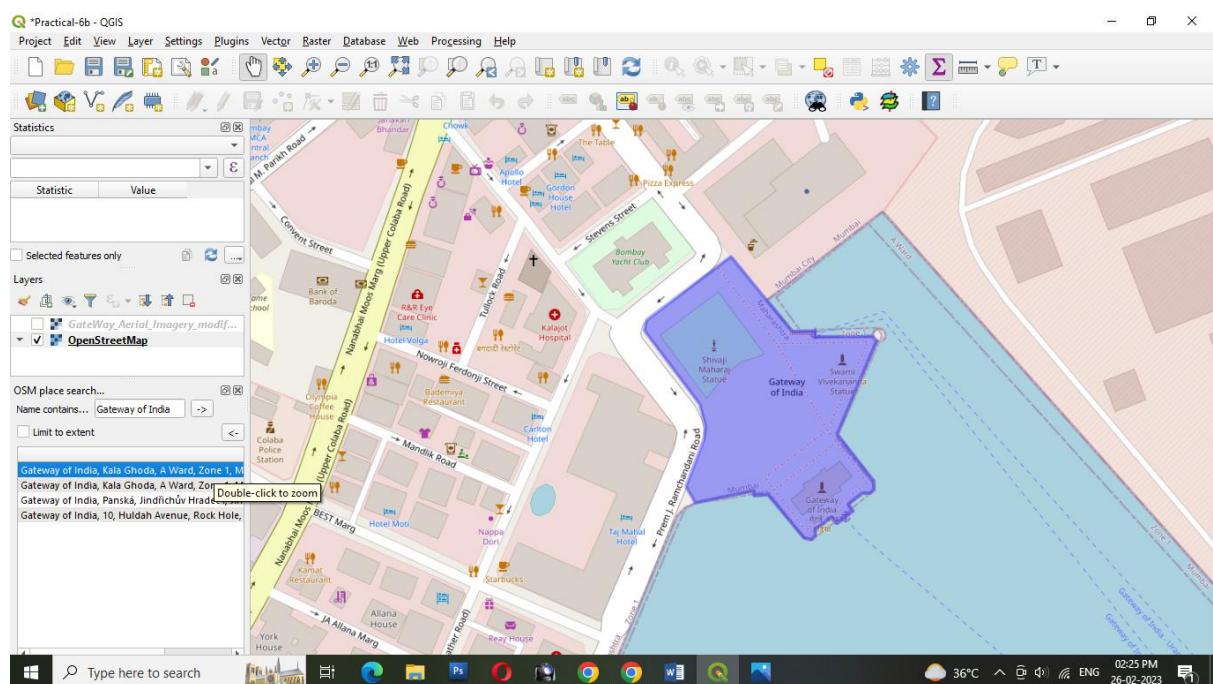
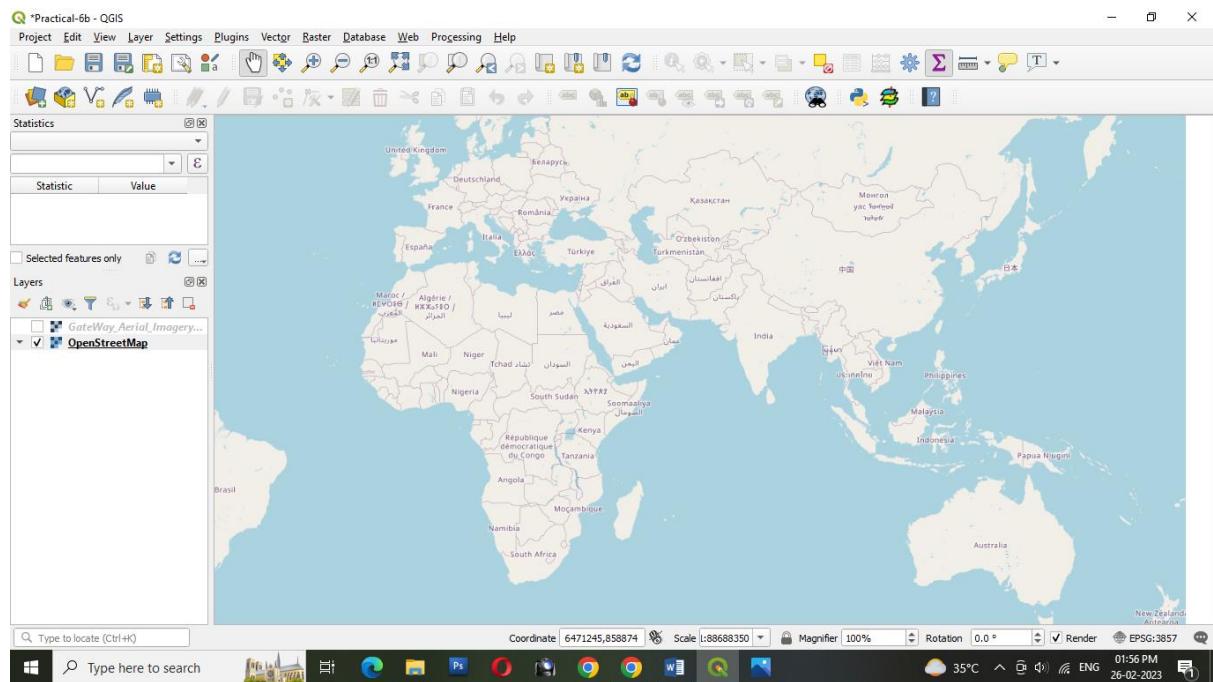


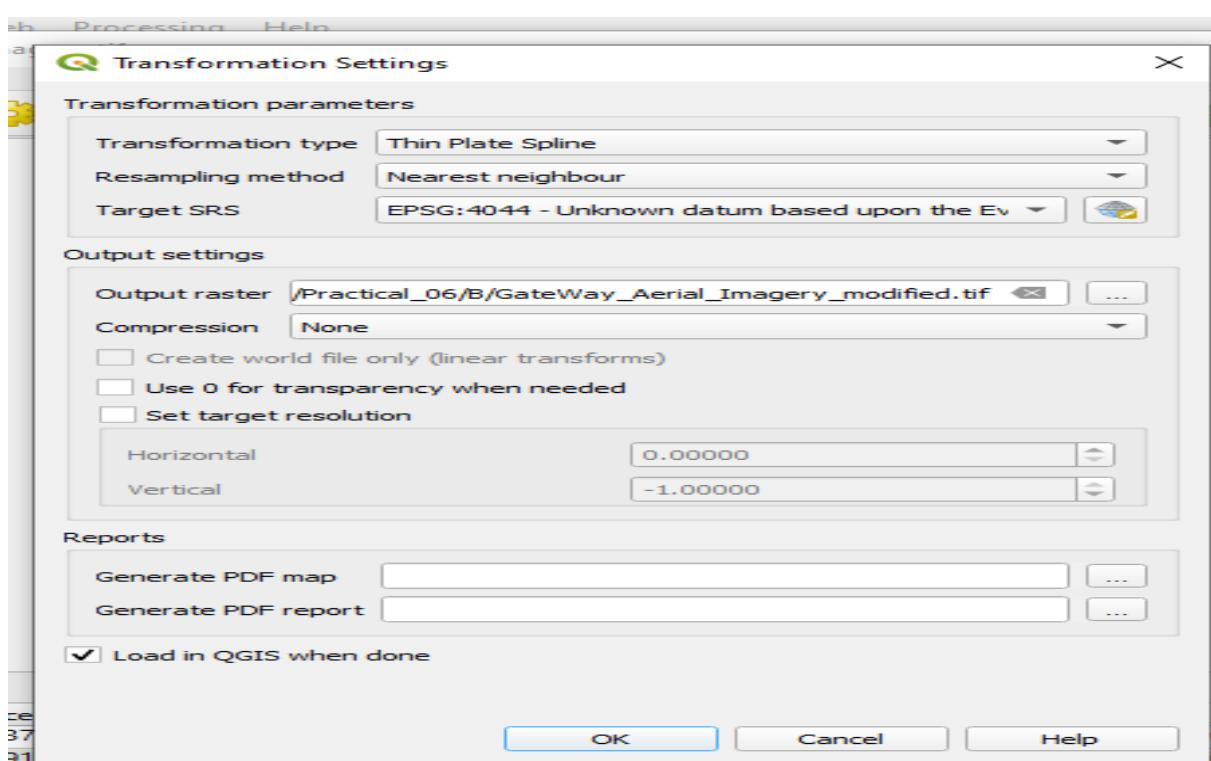
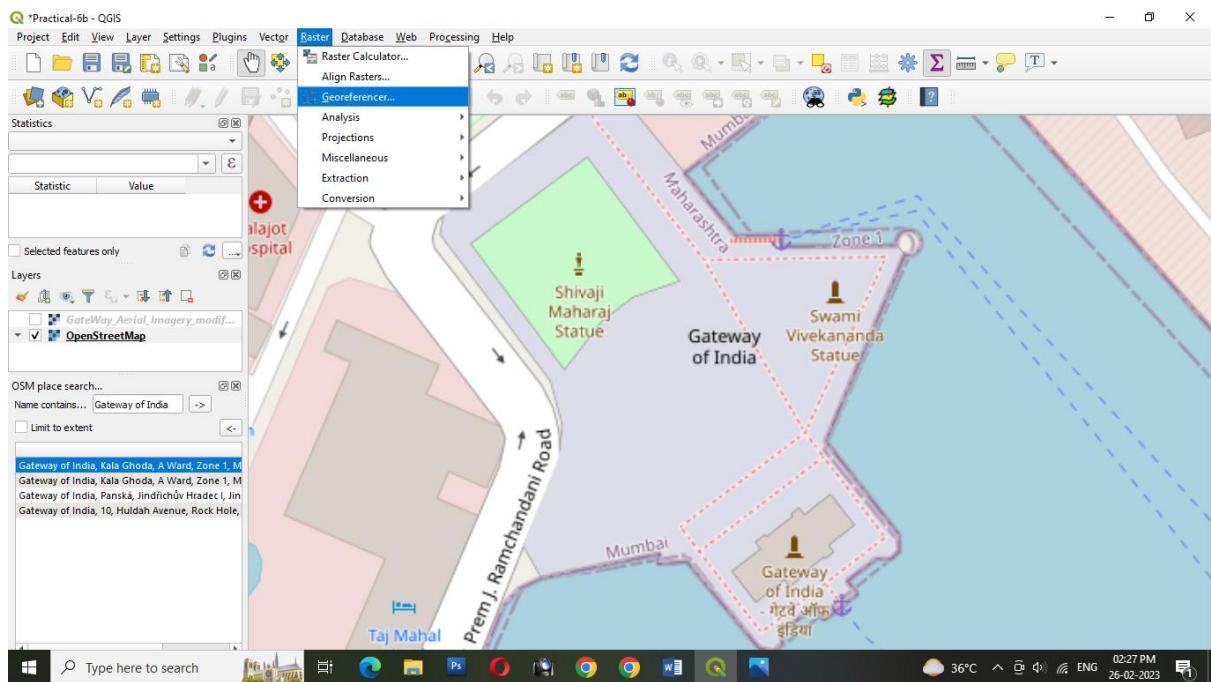


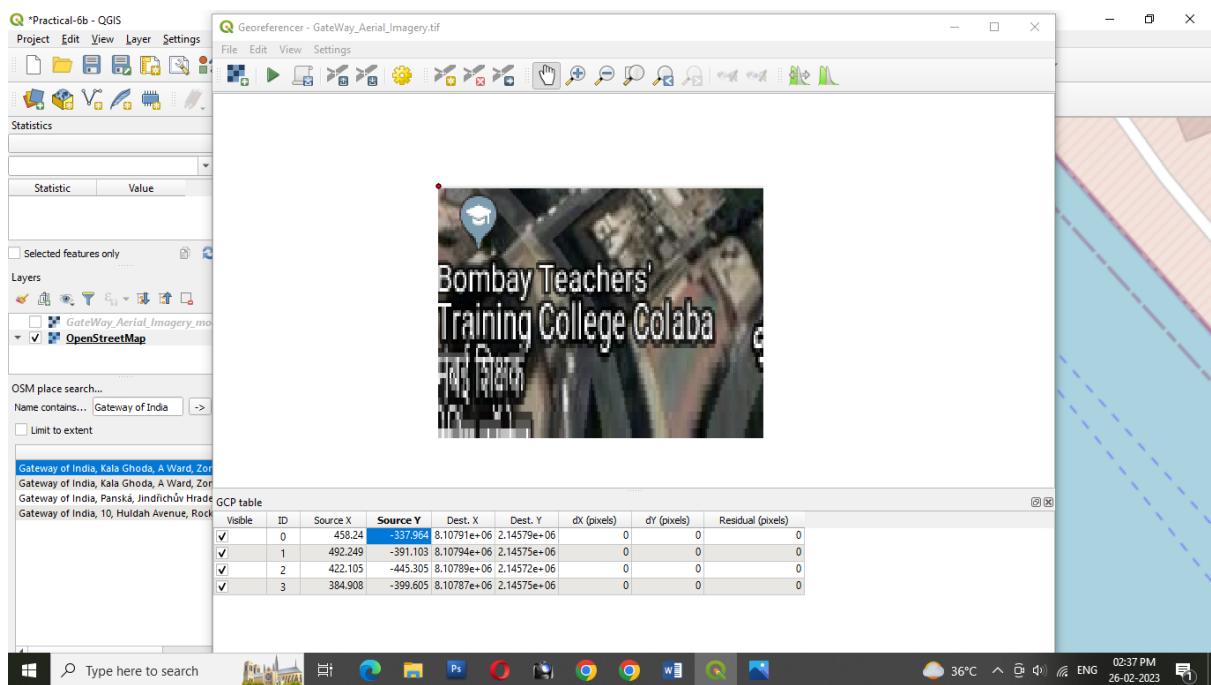
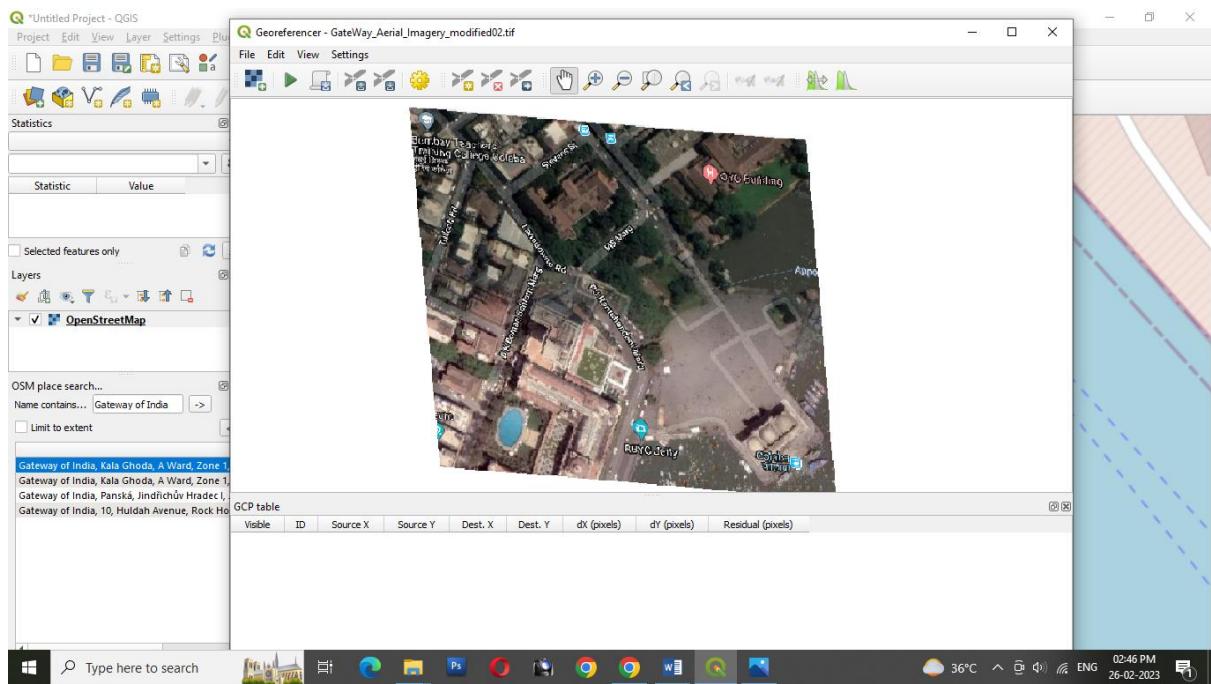


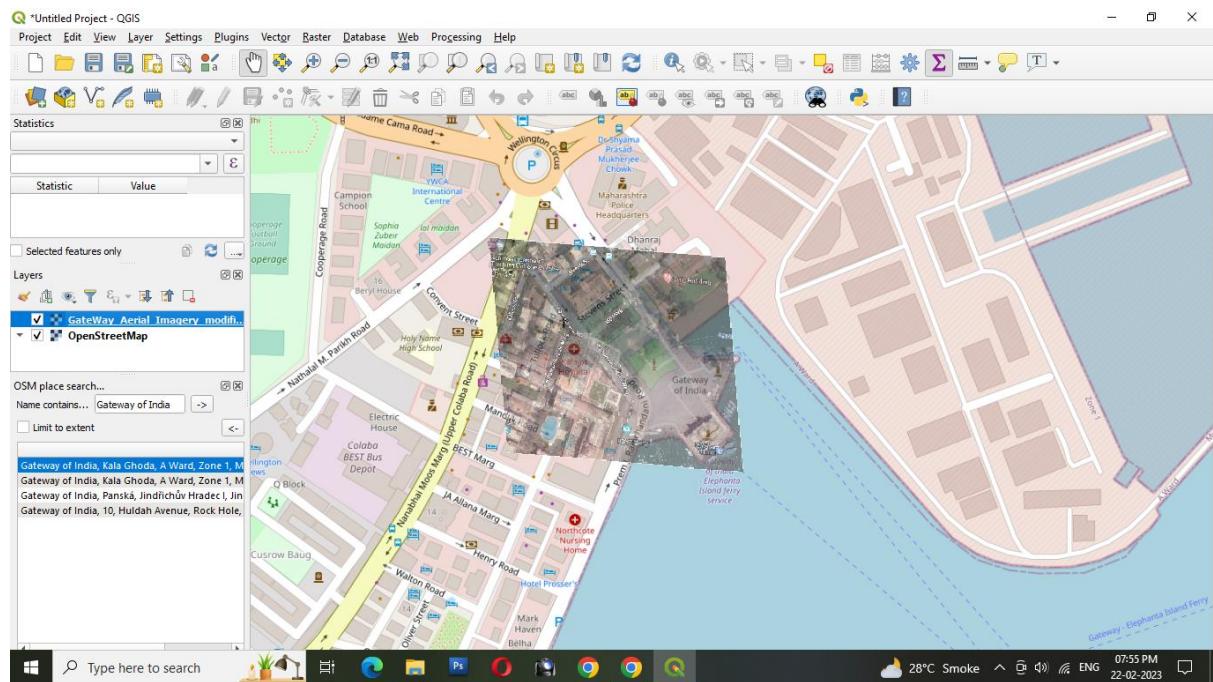
5(B) Georeferencing Aerial Imagery



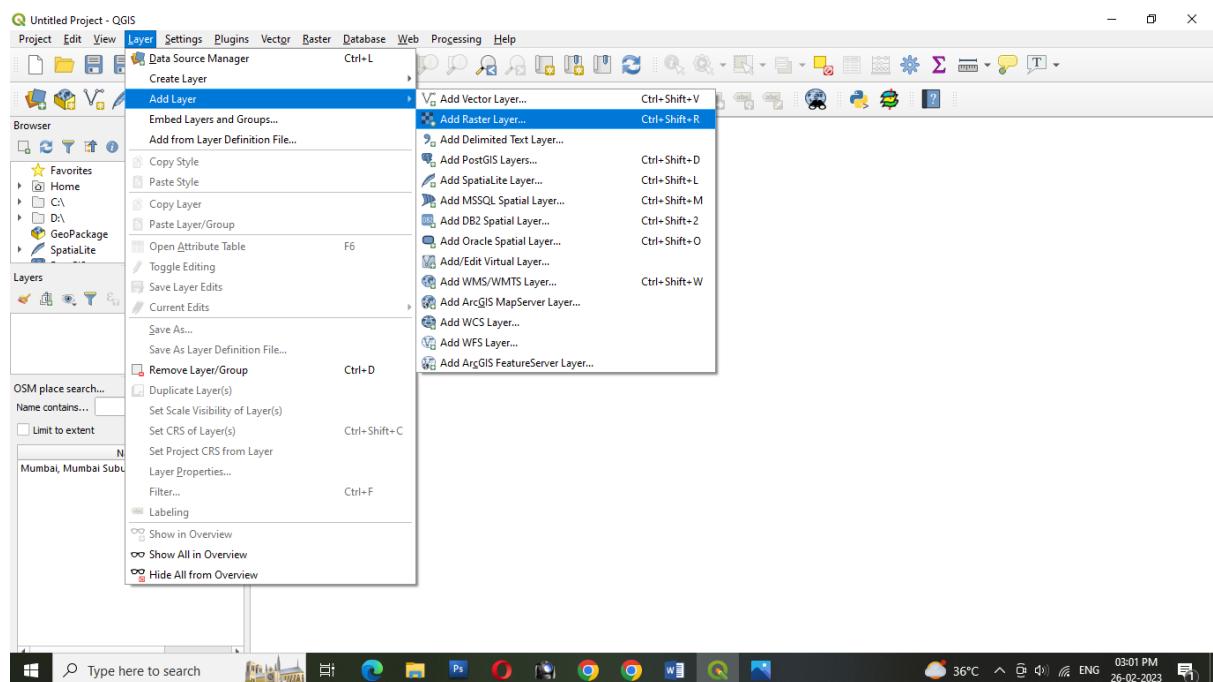


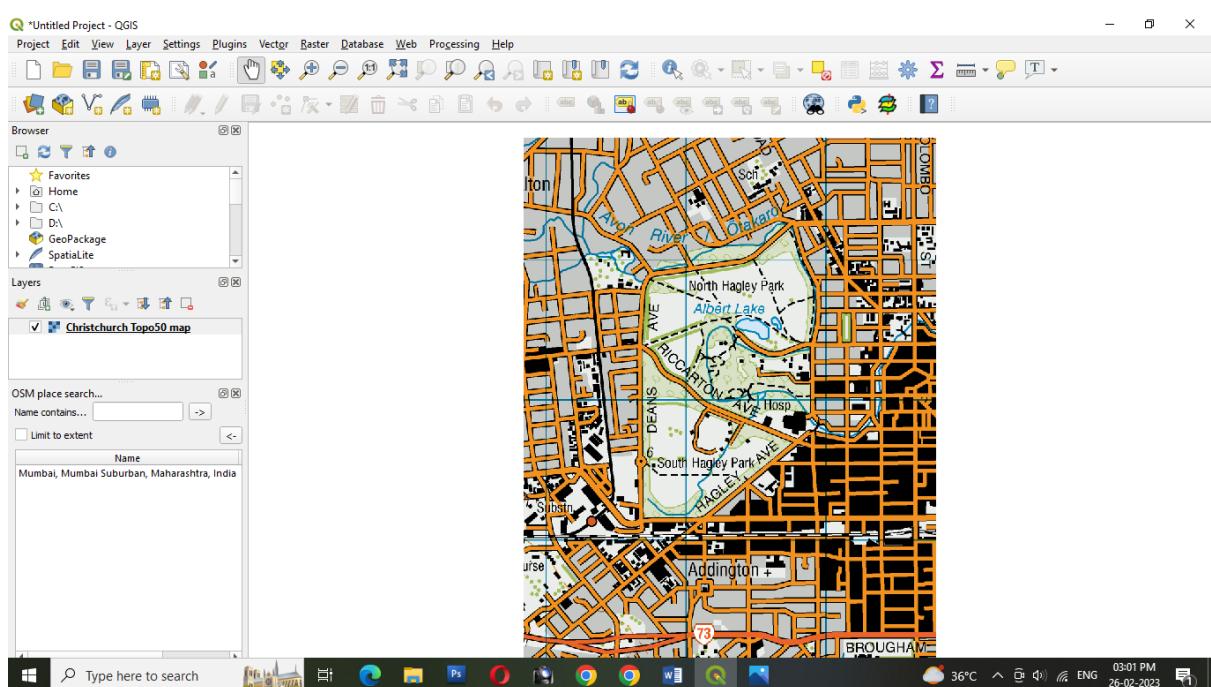
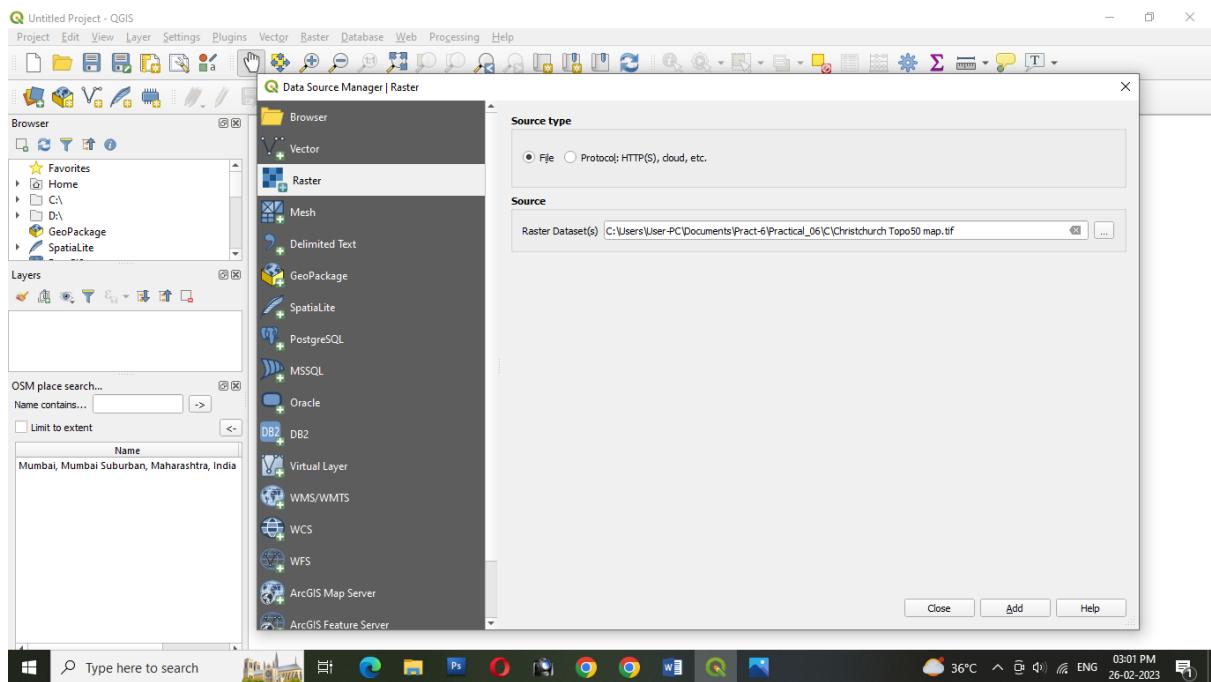


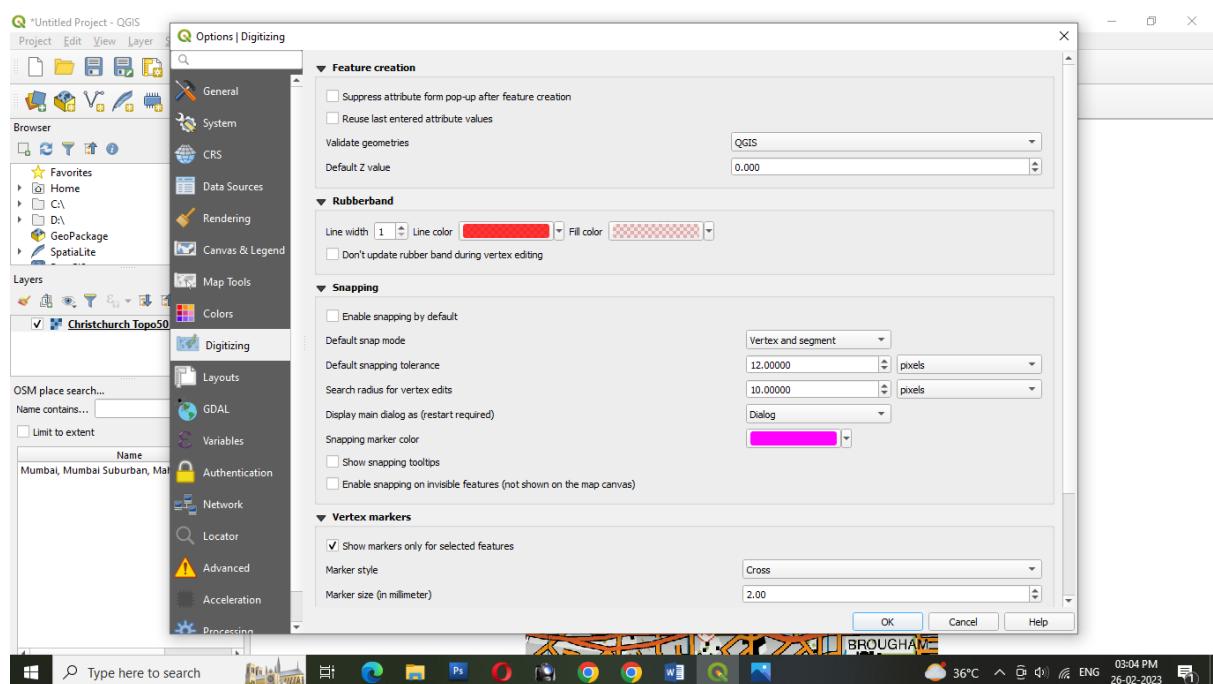
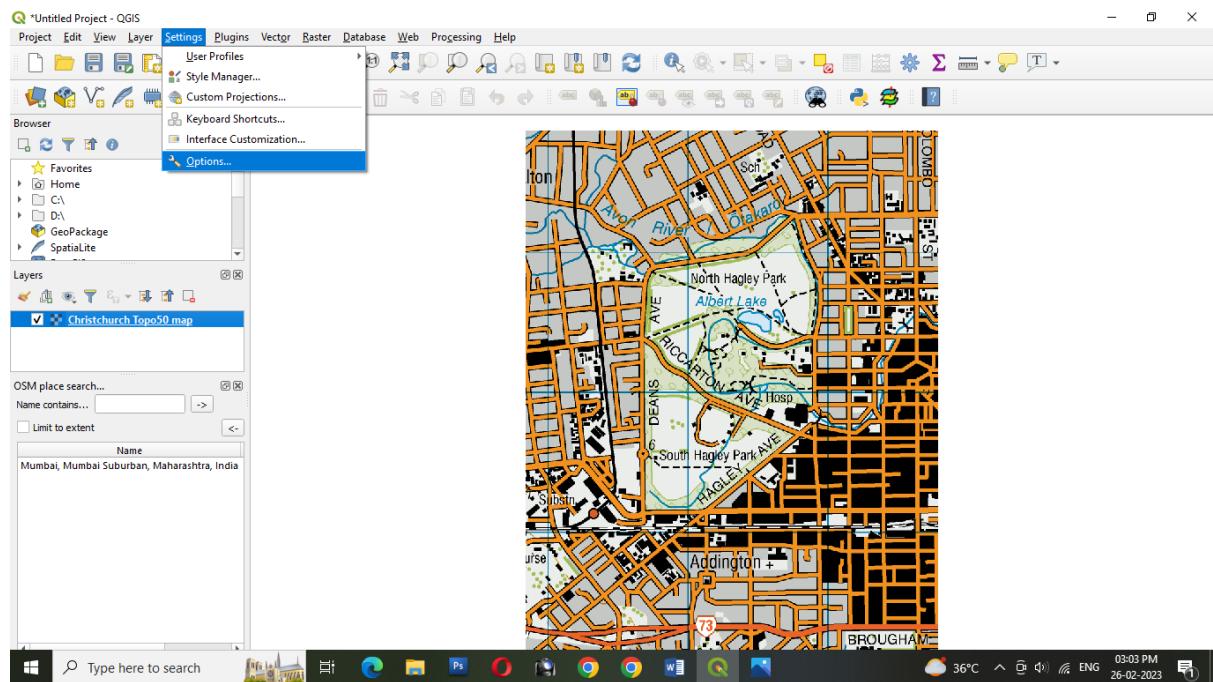


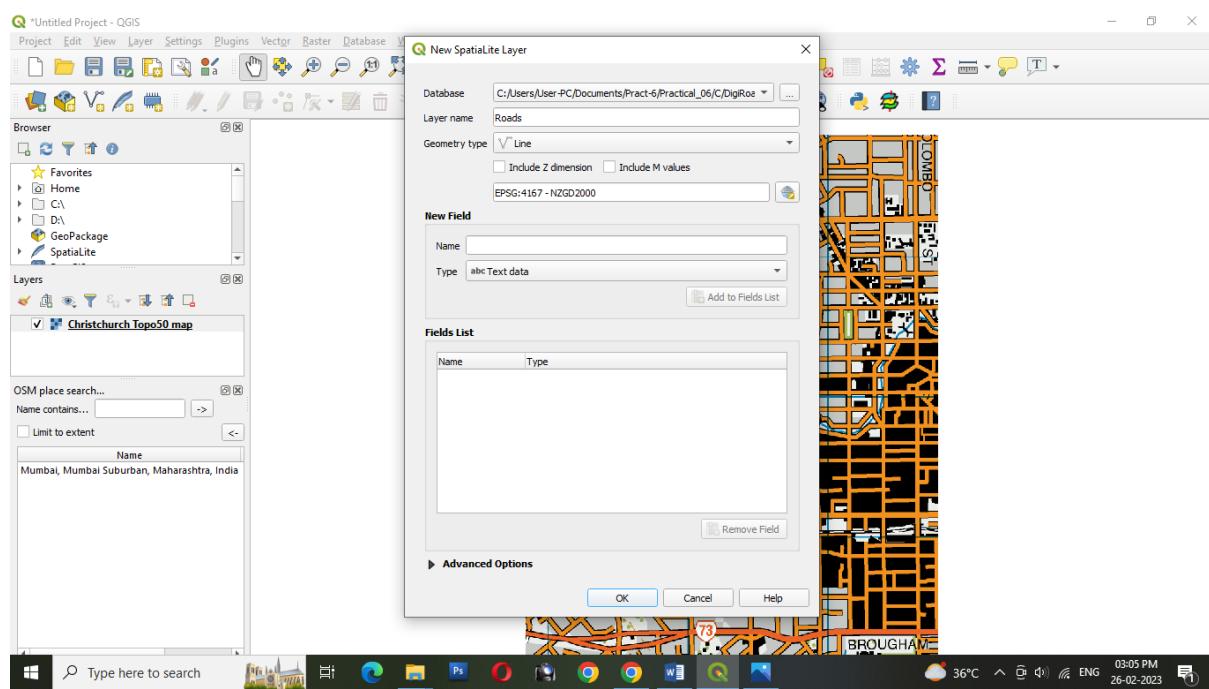
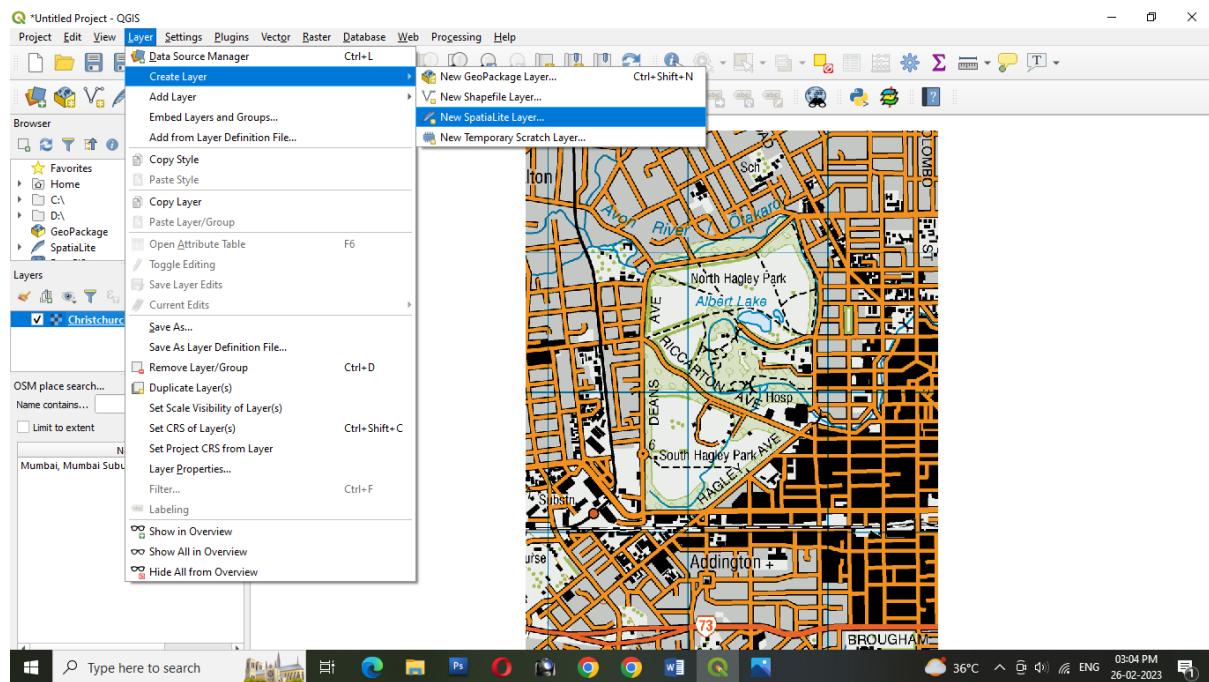


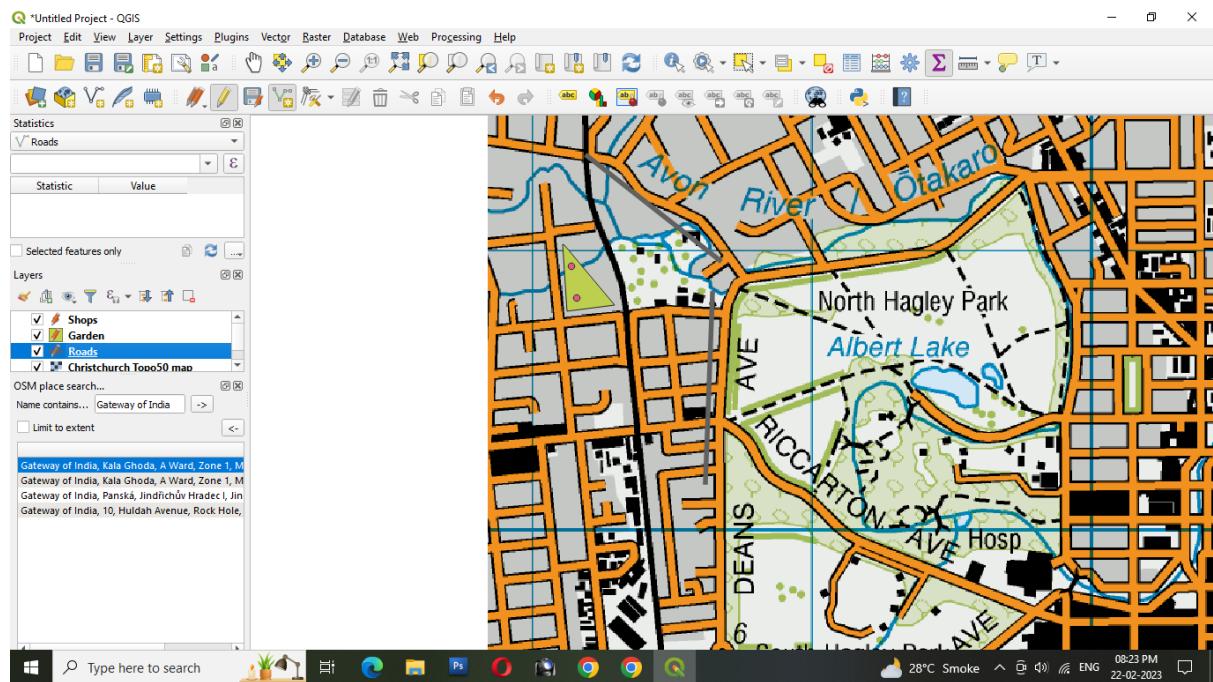
5(C) Digitizing Map Data





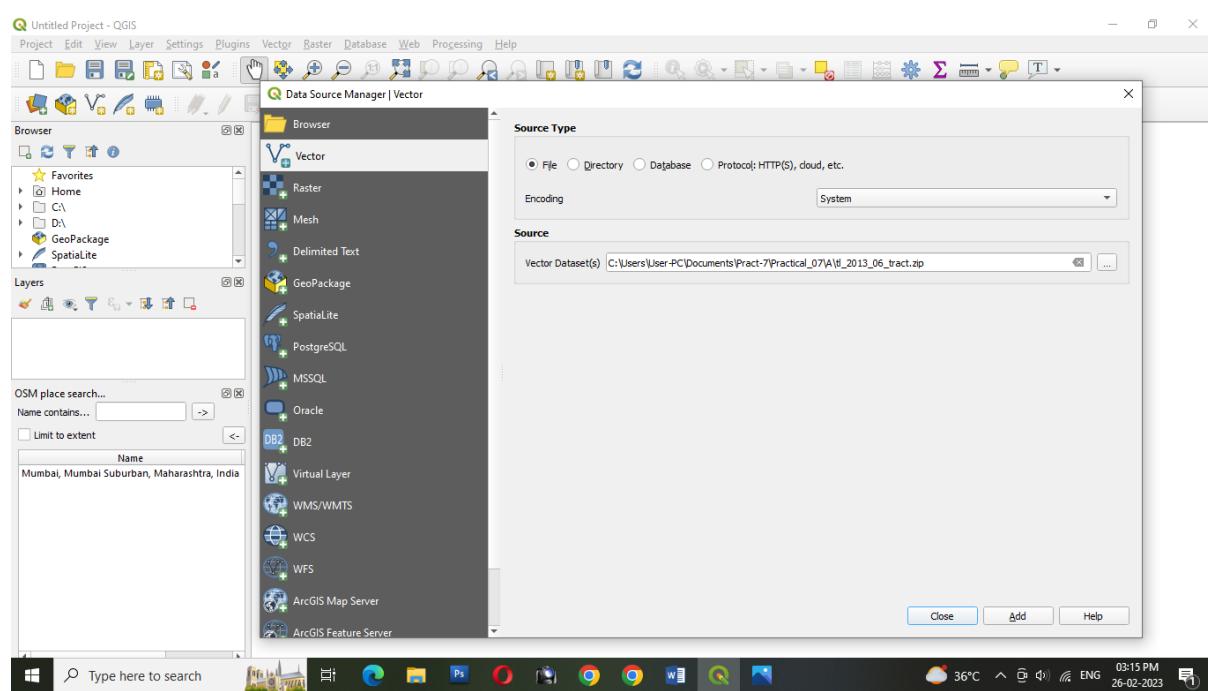
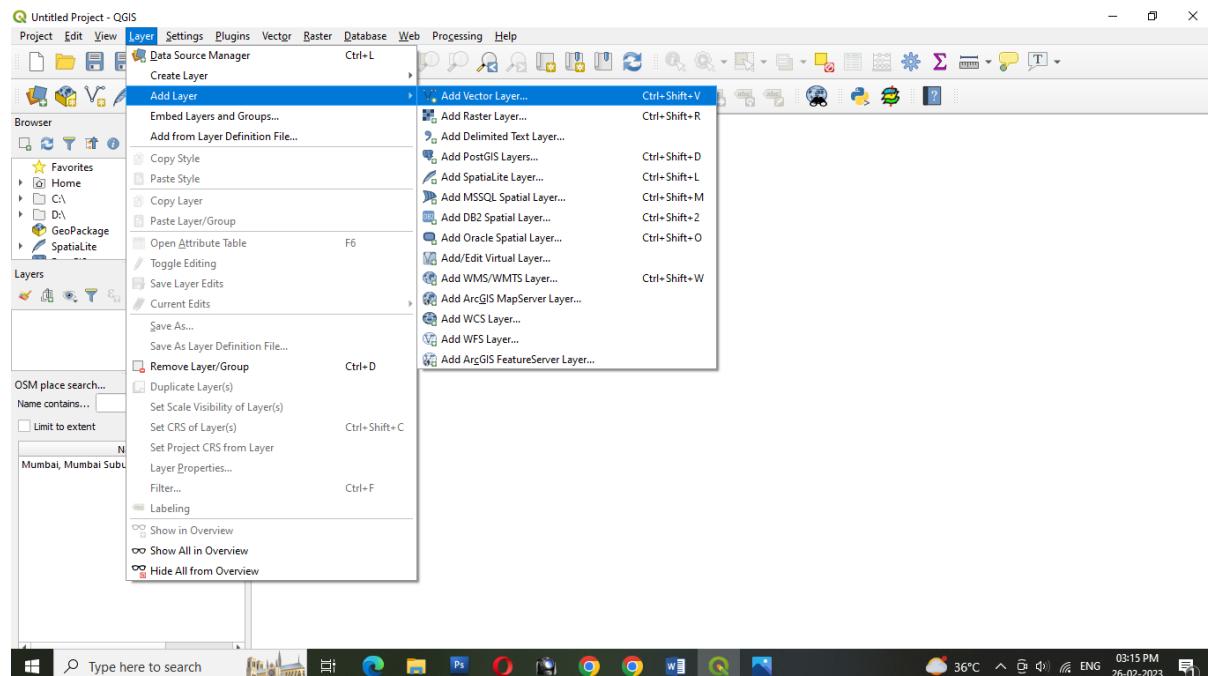


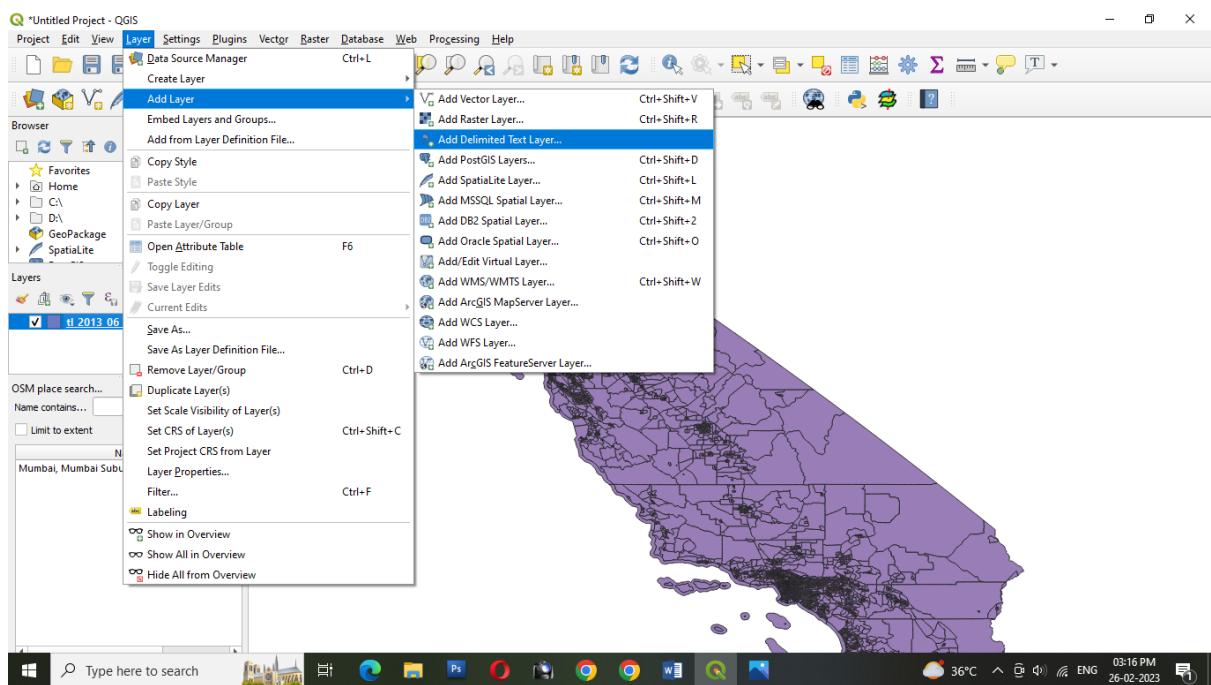
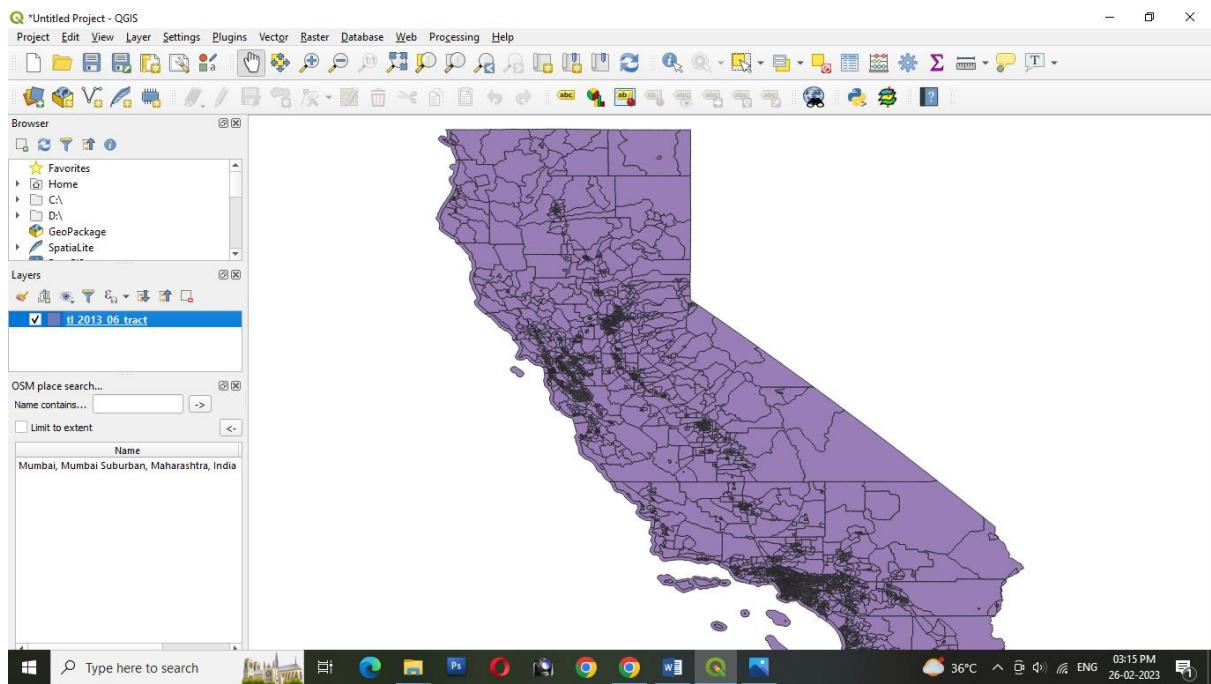


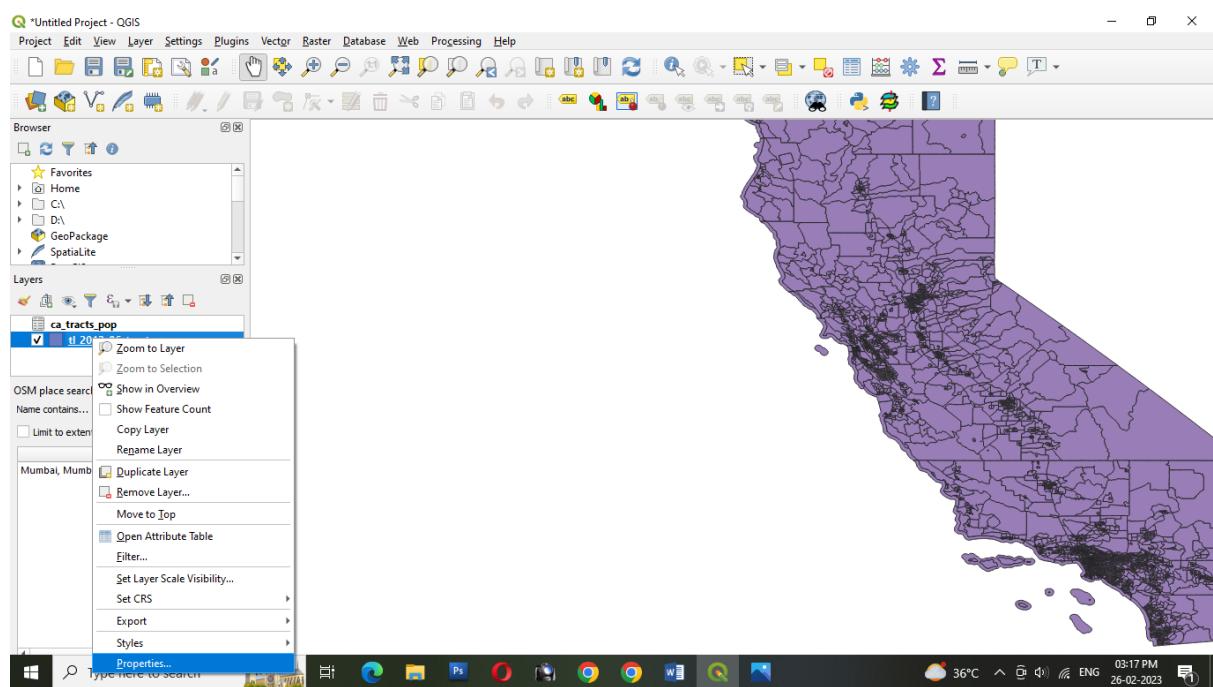
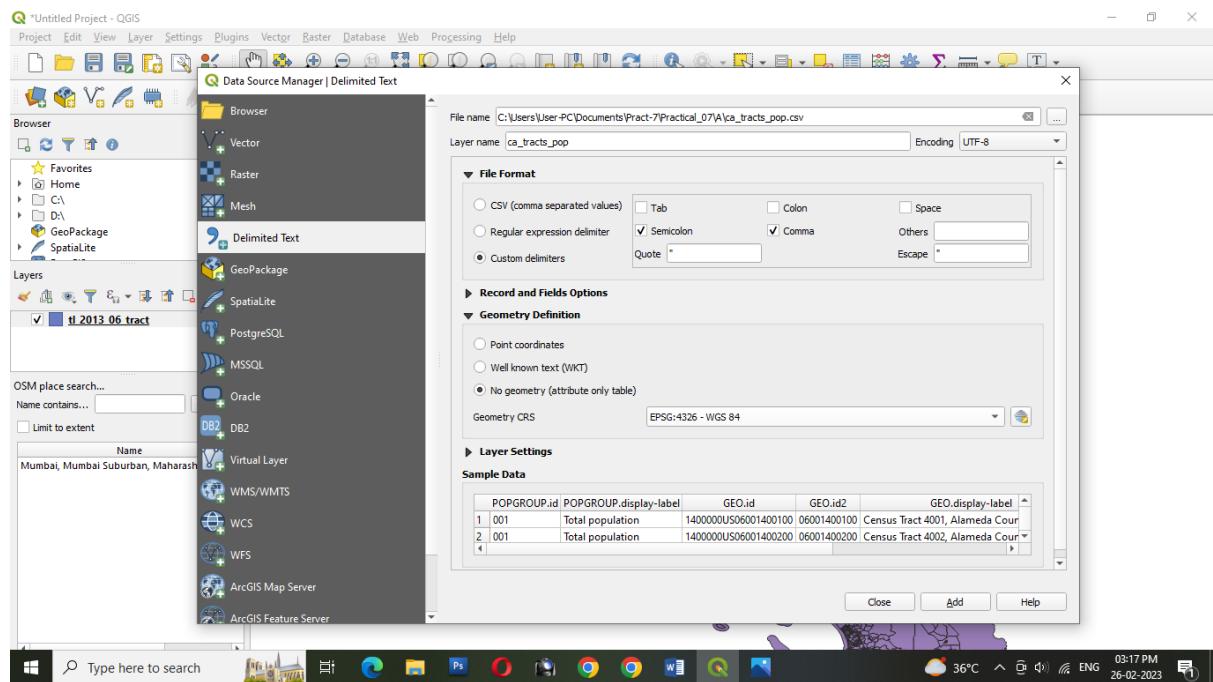


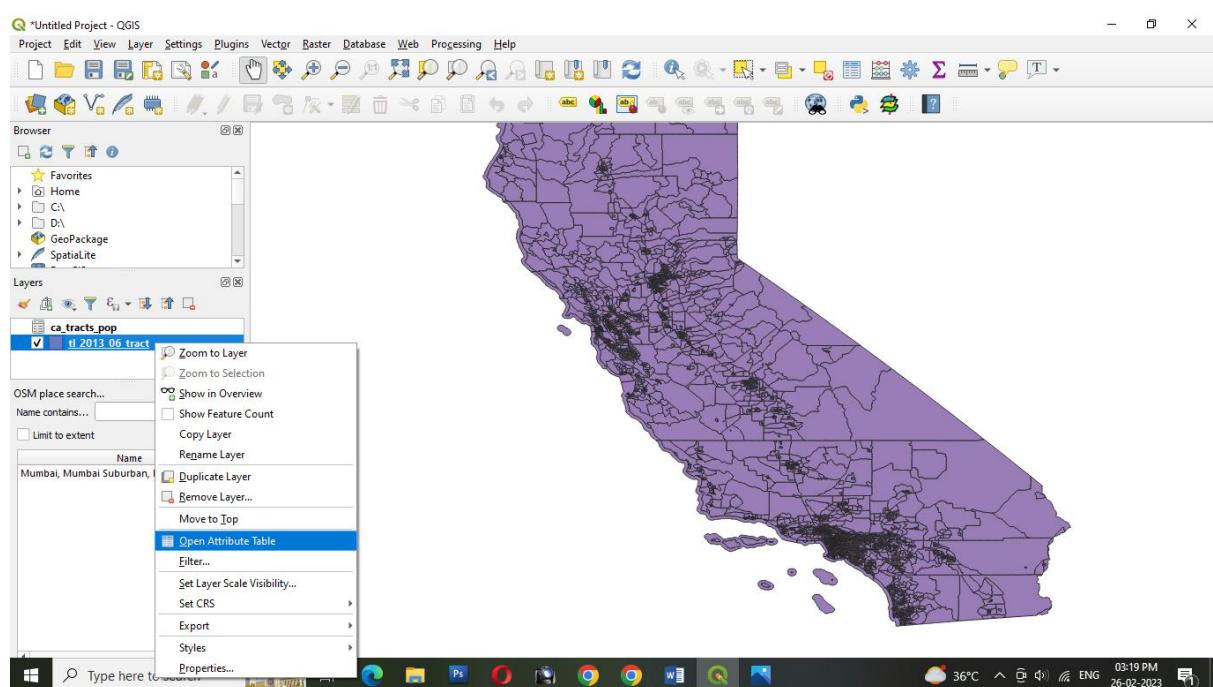
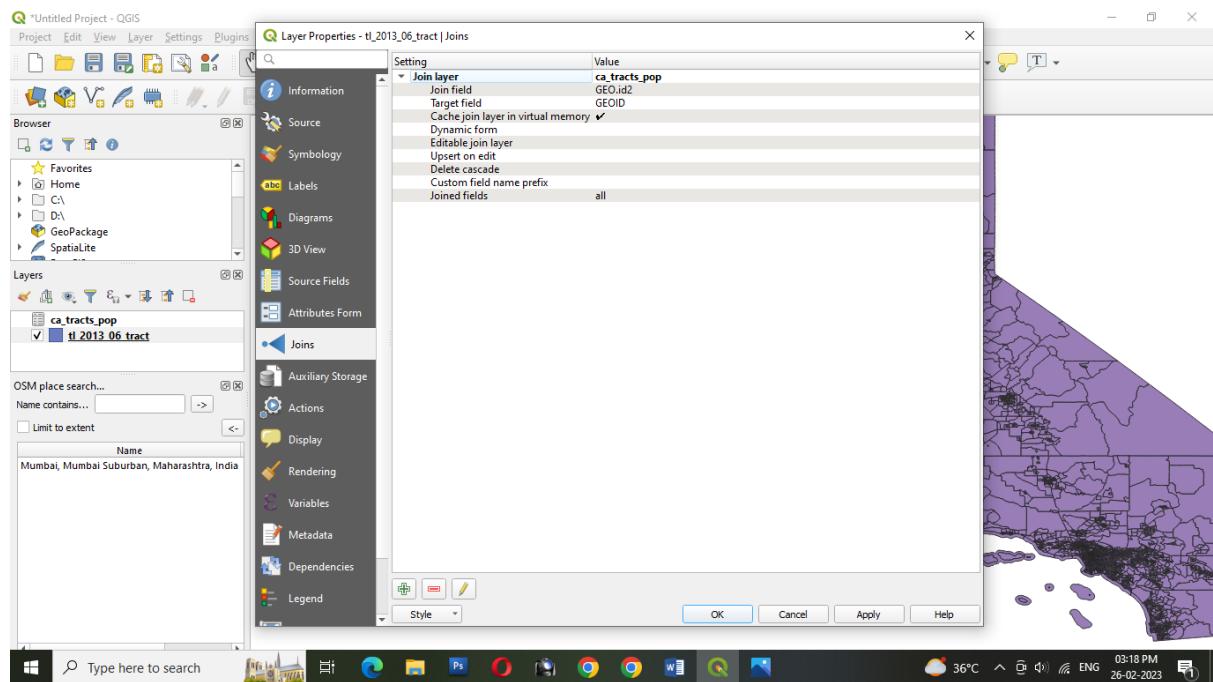
Practical 6: MANAGING DATA TABLES AND SPATIAL DATA SETS

6(A) Table join in qgis

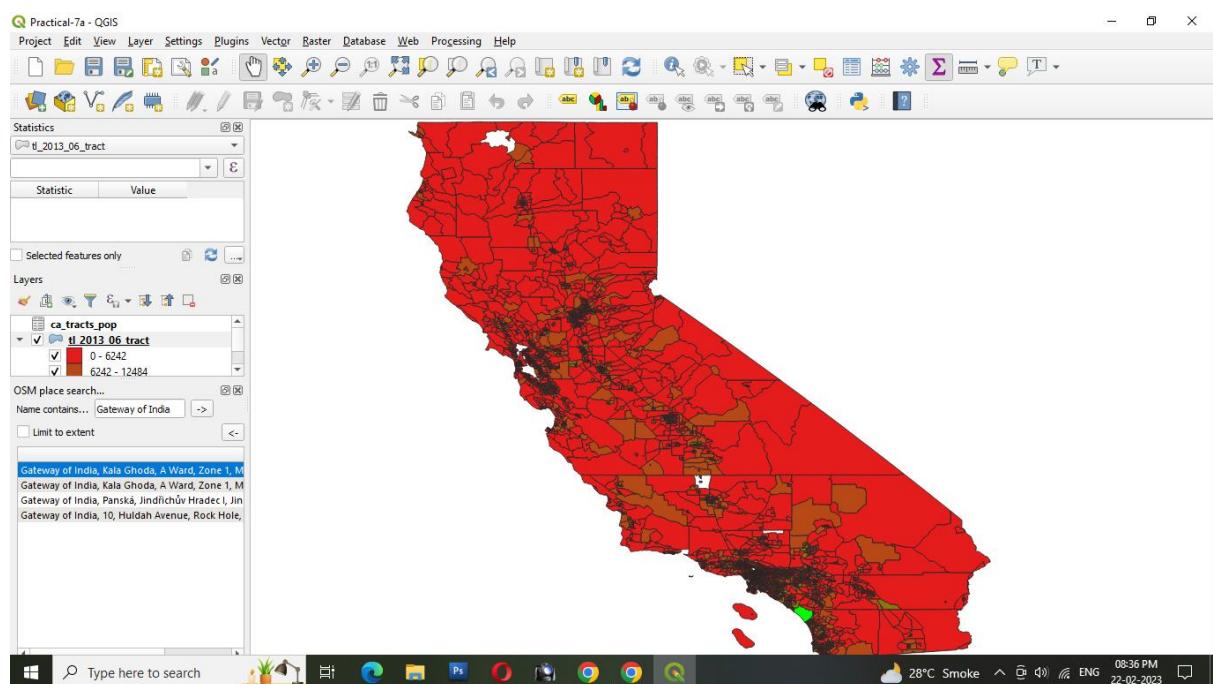




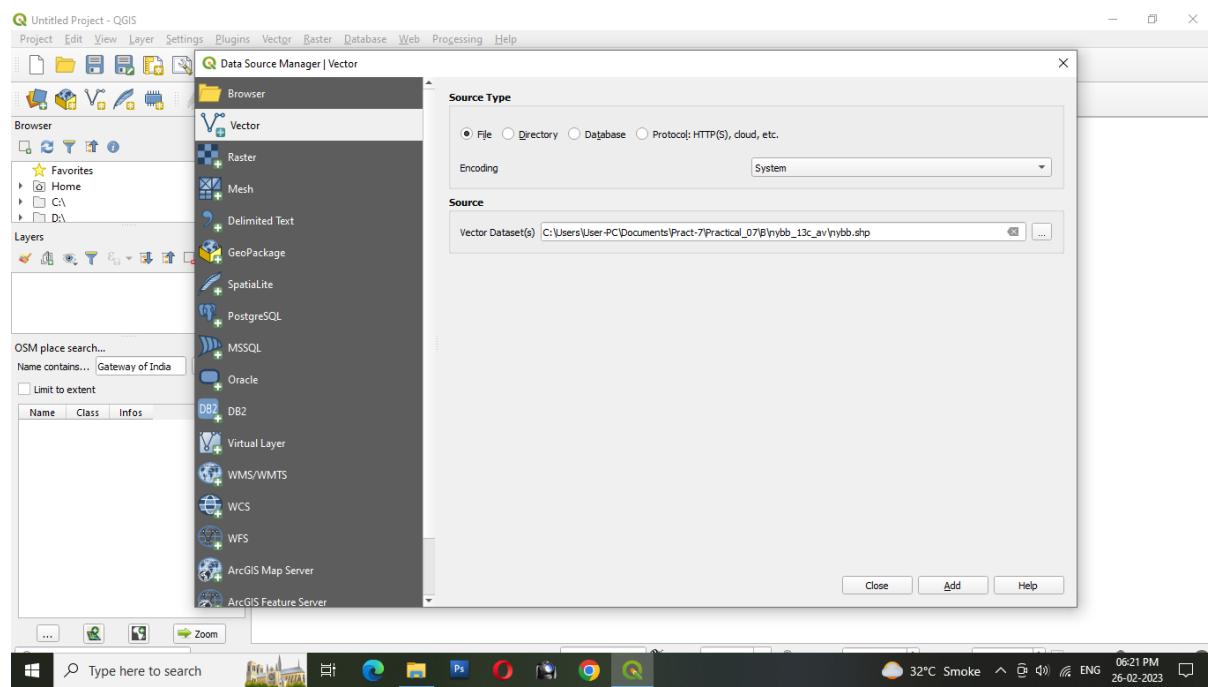
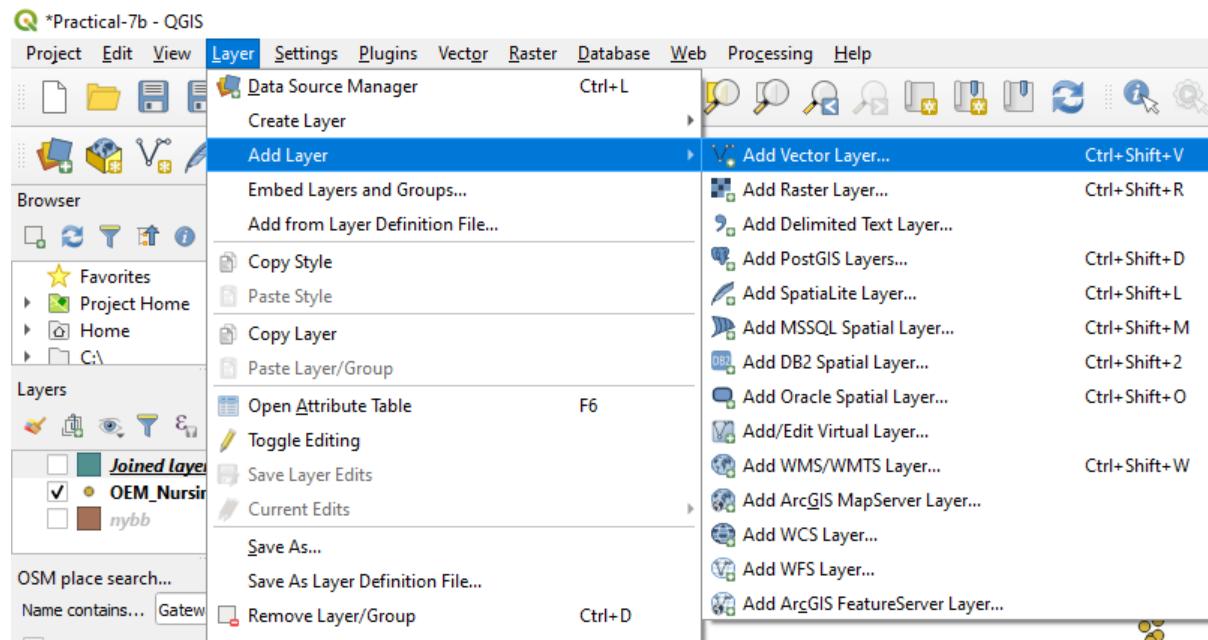


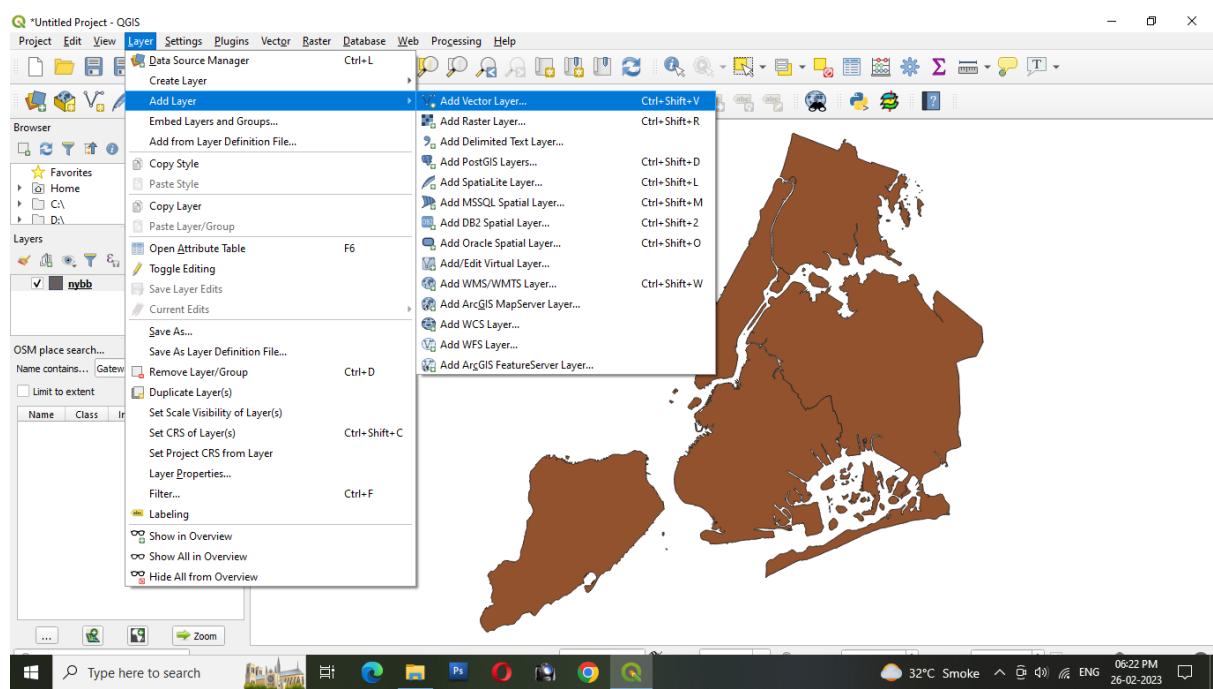
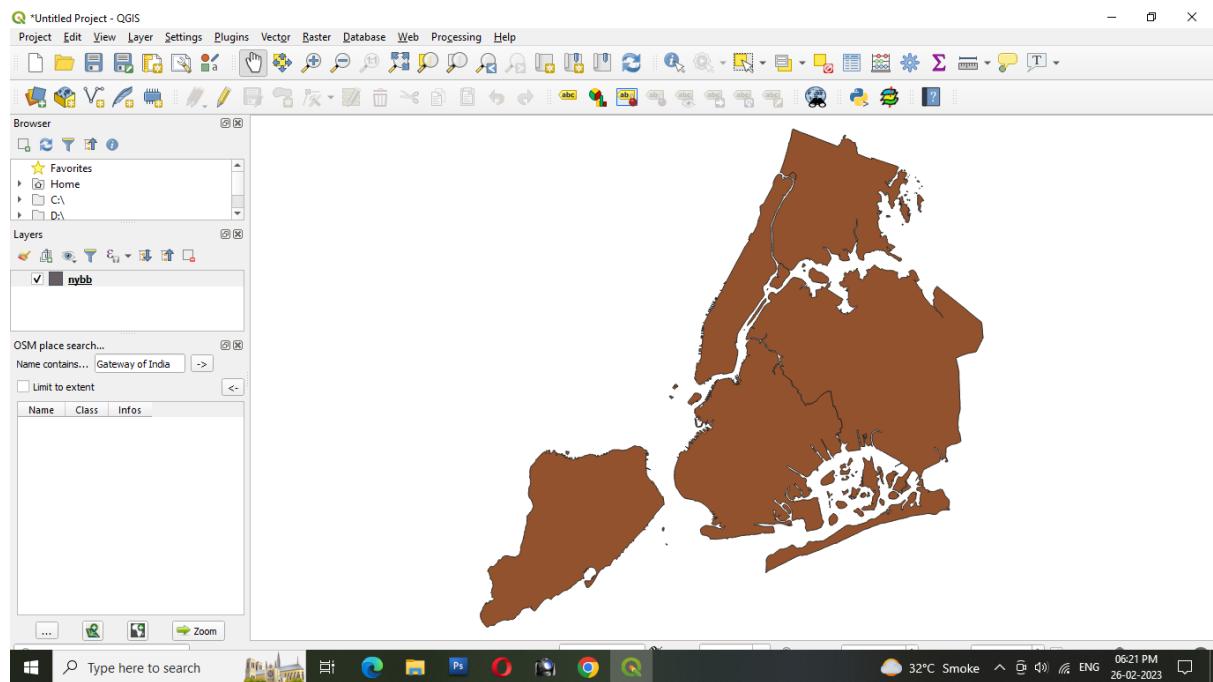


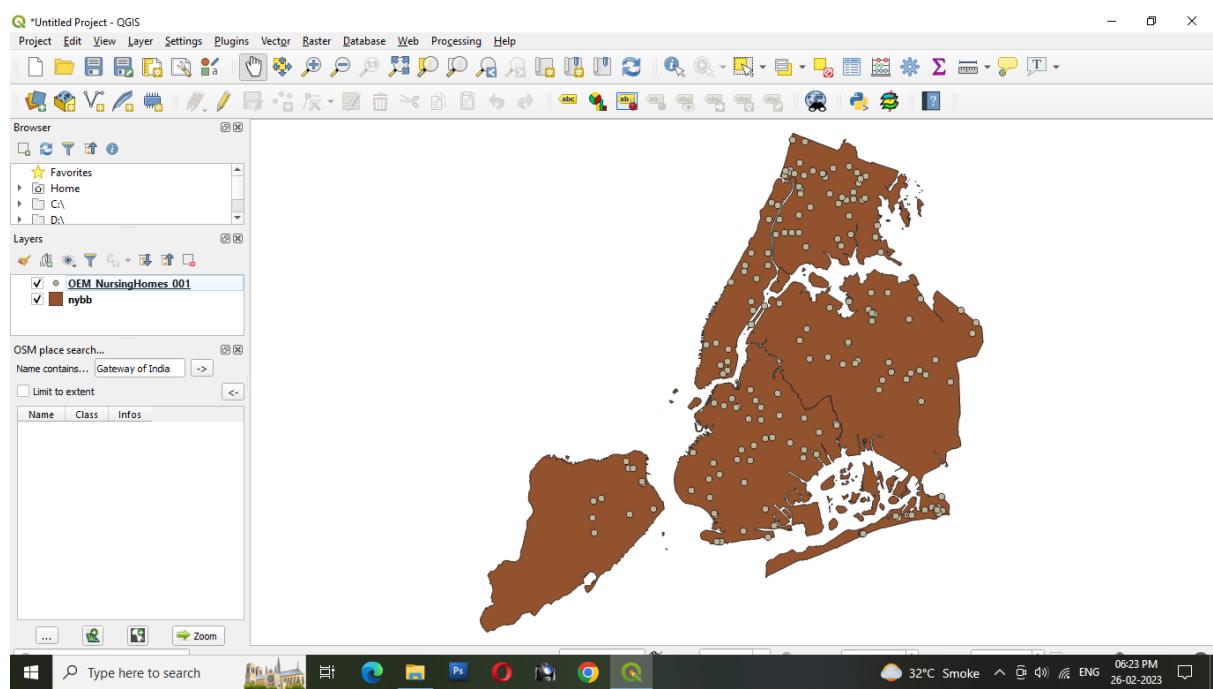
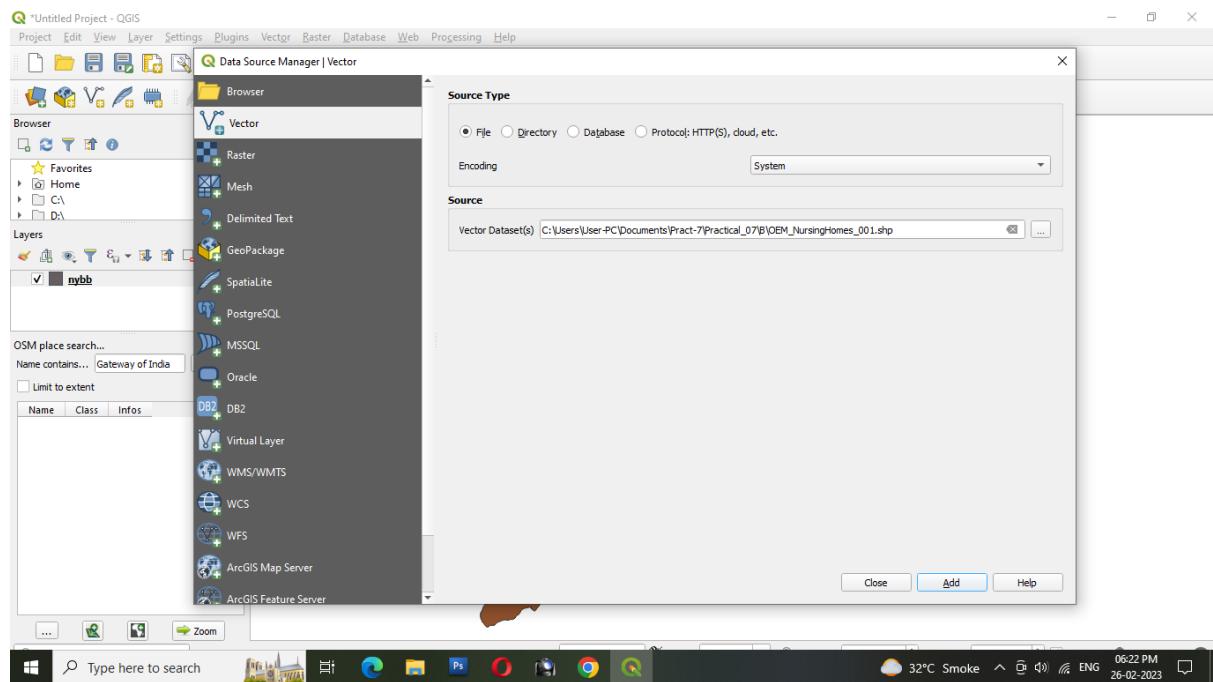
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1	06	019	003808	06019003808	38.08	Census Tract 38..	G5020	S	4573635	0	+36.7590347	-119.8712115	001	Tot
2	06	037	101122	06037101122	1011.22	Census Tract 10..	G5020	S	2644040	0	+34.2677213	-118.2901465	001	Tot
3	06	037	104404	06037104404	1044.04	Census Tract 10..	G5020	S	539620	0	+34.2639207	-118.4286916	001	Tot
4	06	037	604002	06037604002	6040.02	Census Tract 60..	G5020	S	650672	0	+33.8765977	-118.3569295	001	Tot
5	06	037	701304	06037701304	7013.04	Census Tract 70..	G5020	S	2078458	243797	+34.0295136	-118.5076229	001	Tot
6	06	037	106405	06037106405	1064.05	Census Tract 10..	G5020	S	1171699	0	+34.3146862	-118.4482858	001	Tot
7	06	037	106407	06037106407	1064.07	Census Tract 10..	G5020	S	232127	0	+34.3105742	-118.4365572	001	Tot
8	06	037	104703	06037104703	1047.03	Census Tract 10..	G5020	S	1169842	0	+34.2552325	-118.4005905	001	Tot
9	06	037	104704	06037104704	1047.04	Census Tract 10..	G5020	S	1662660	0	+34.2625316	-118.4088637	001	Tot
10	06	019	004902	06019004902	49.02	Census Tract 49..	G5020	S	1000616	0	+36.7894606	-119.8074490	001	Tot
11	06	019	003301	06019003301	33.01	Census Tract 33..	G5020	G5020	1307911	0	+36.7759433	-119.7634790	001	Tot
12	06	037	670413	06037670413	6704.13	Census Tract 67..	G5020	S	2186216	0	+33.7725815	-118.3974684	001	Tot
13	06	019	004801	06019004801	48.01	Census Tract 48..	G5020	S	1172504	0	+36.7842412	-119.8120789	001	Tot
14	06	037	296401	06037296401	2964.01	Census Tract 29..	G5020	S	986901	1098	+33.7411716	-118.3150067	001	Tot
15	06	037	101400	06037101400	1014	Census Tract 1014	G5020	S	6310052	0	+34.2428521	-118.2941612	001	Tot
16	06	037	294421	06037294421	2944.21	Census Tract 29..	G5020	S	664605	0	+33.7903731	-118.2975664	001	Tot
17	06	037	294701	06037294701	2947.01	Census Tract 29..	G5020	S	1751946	0	+33.7780161	-118.2549079	001	Tot
18	06	073	015302	06073015302	153.02	Census Tract 15..	G5020	S	3394238	0	+32.7743450	-116.9700122	001	Tot
19	06	073	010104	06073010104	101.04	Census Tract 10..	G5020	S	1619360	0	+32.5673601	-117.0970321	001	Tot
20	06	073	018510	06073018510	185.10	Census Tract 18..	G5020	S	1992068	5513	+33.2158066	-117.3364699	001	Tot
21	06	073	018510	06073018510	185.10	Census Tract 18..	G5020	S	220770	0	+33.2176200	-117.3364697	001	Tot

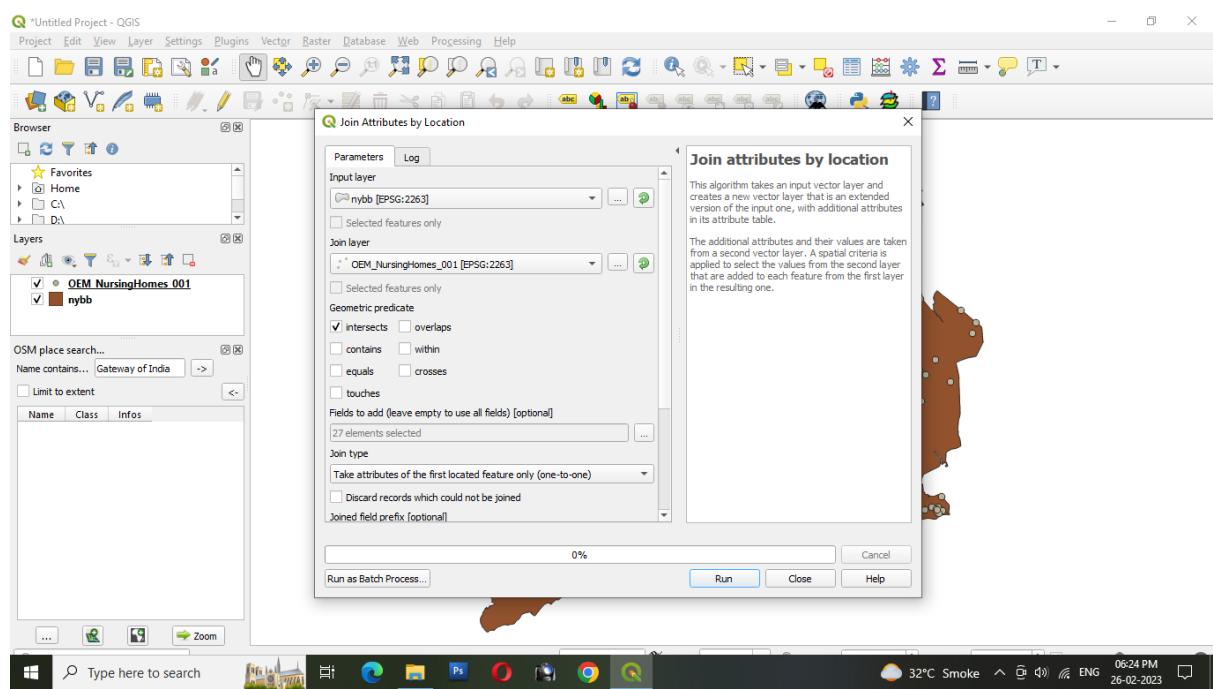
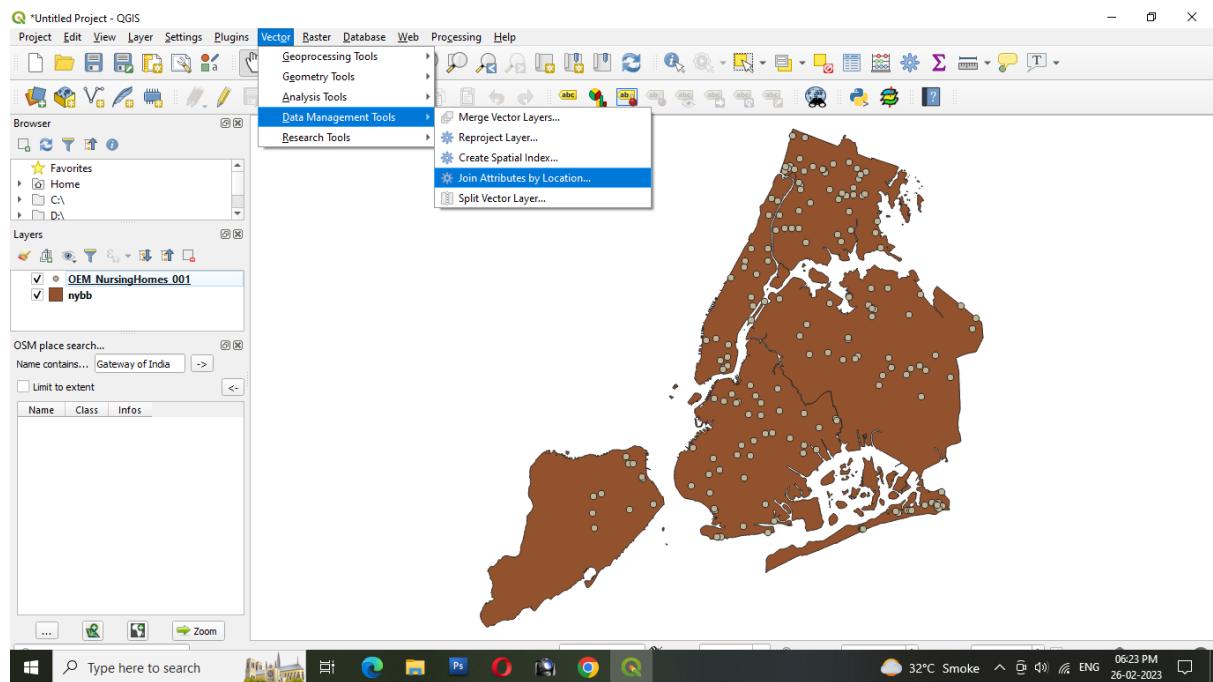


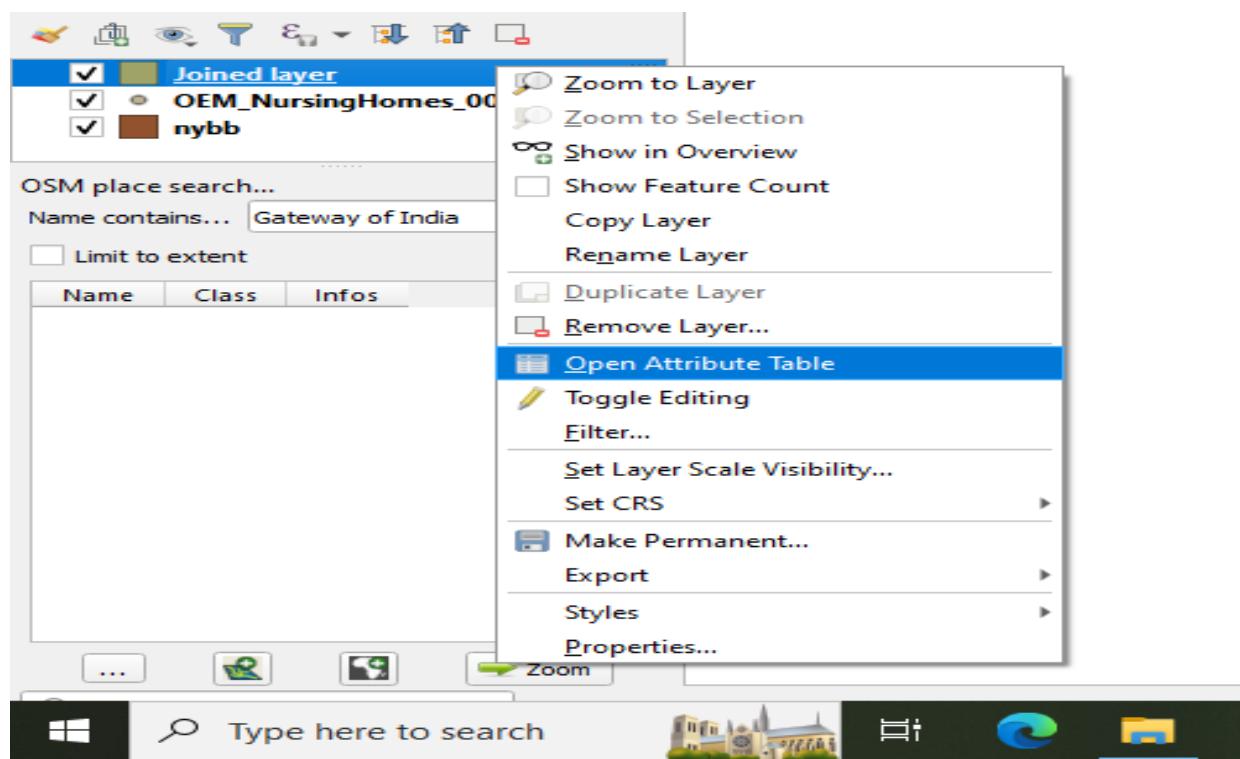
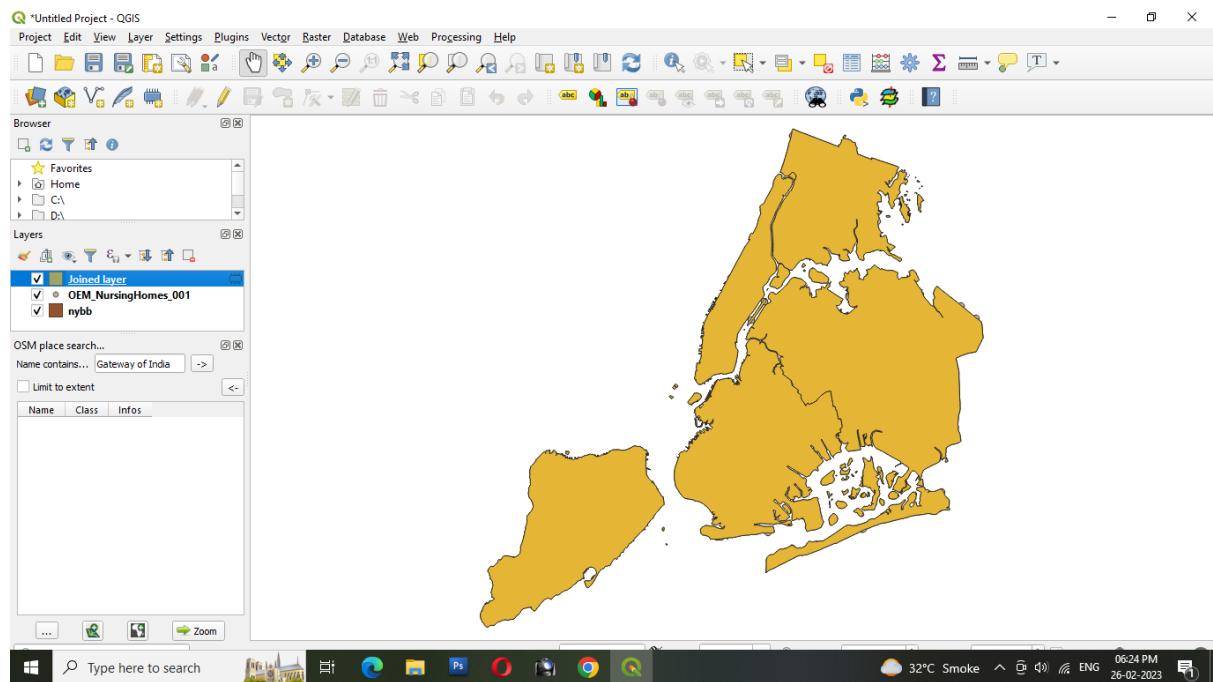
6(B) Spatial Joins in Qgis











Joined layer :: Features Total: 5, Filtered: 5, Selected: 0

BoroCode	BoroName	Shape_Leng	Shape_Area	Label	Name	Address	City	Zipcode	PFI	OpCert	Capacity	Baseline	AIDS
1	2 Bronx	464475.0676990...	1186823812.599...	BRONX CENTER	BRONX CENTE...	1010 UNDERHIL...	BRONX	10472	1251.00000000000...	7000381.000000...	200	1	
2	5 Staten Island	330454.8066070...	1623846991.529...	CARMEL RICH...	CARMEL RICH...	88 OLD TOWN ...	STATEN ISLAND	10304	1755.00000000000...	7004310.000000...	300	1	
3	3 Brooklyn	742297.8304019...	1937844335.480...	BISHOP MUGA...	BISHOP FRANC...	155 DEAN STREET	BROOKLYN	11217	5546.00000000000...	7001377.000000...	288	1	
4	1 Manhattan	357176.1325809...	638397842.6720...	ROBERT MAPPL...	ROBERT MAPPL...	327 EAST 17TH ...	NEW YORK	10003	4807.00000000000...	7002351.000000...	28	1	
5	4 Queens	874225.1394040...	3048478676.510...	NY CRN	NY CENTER FO...	26-13 21ST STR...	ASTORIA	11102	6384.00000000000...	7003405.000000...	280	1	

Show All Features

Type here to search

32°C Smoke 06:26 PM 26-02-2023

*Untitled Project - QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Help

Identify Features (Ctrl+Shift+I)

Browser

*Untitled Project - QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Help

Identify Results

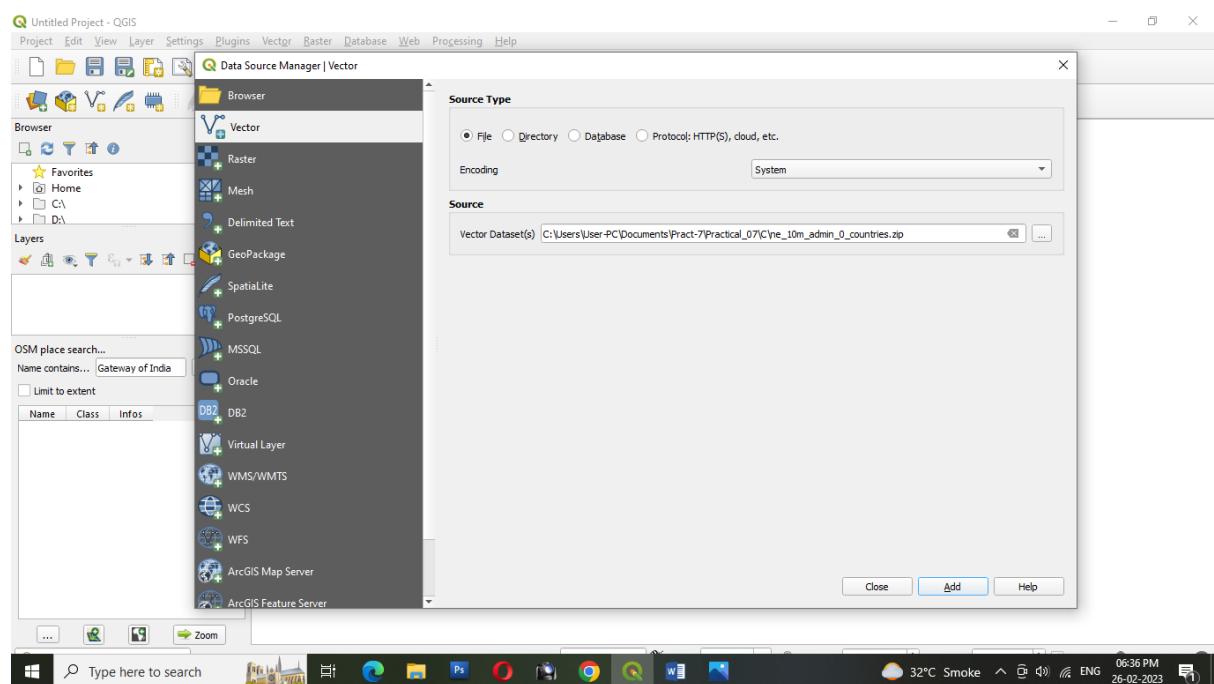
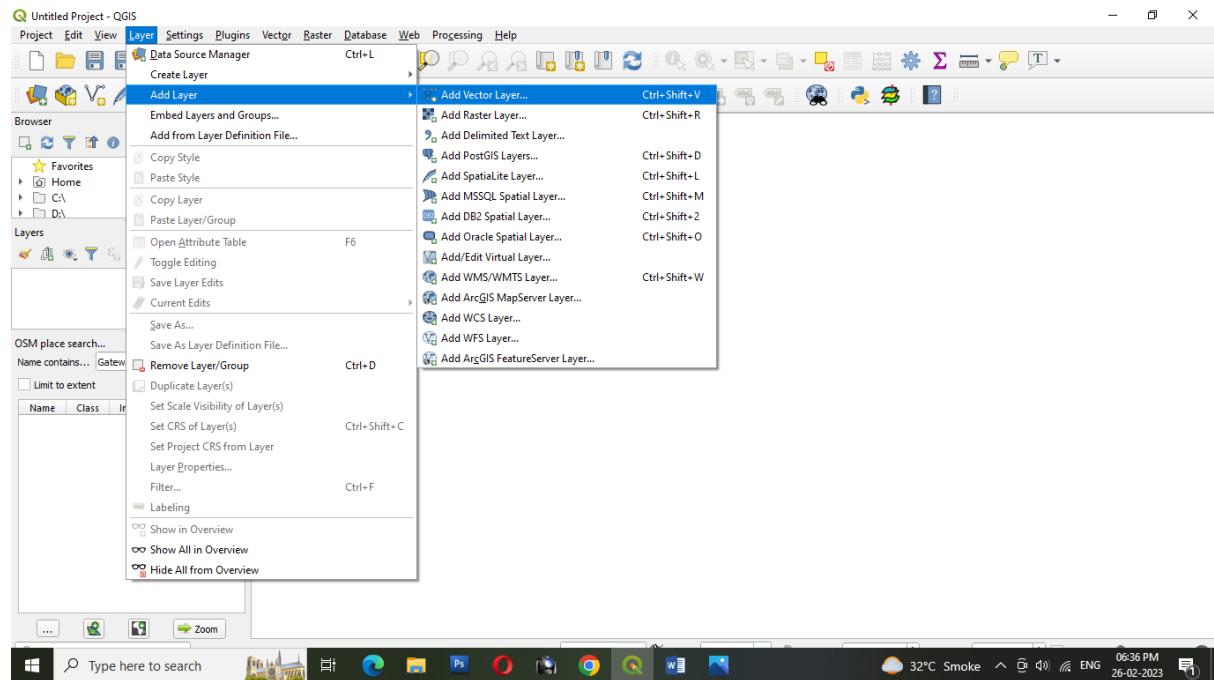
Feature	Value
Joined layer	Queens
BoroName	(Det...)
Boro...	4
Bor...	Queens
Sha...	874225.13940400002
Sha...	3048478676.5100002888
Label	NY CRN
Name	NY CENTER FOR REHAB & NURSING
Add...	26-13 21ST STREET
City	ASTORIA
Zipc...	11102
PFI	6384.00000000000...
OpC...	7003405.00000000000
Cap...	280
Base...	1
AIDS	0
Ado...	0
Lab...	0
Heal...	0
Rad...	0
LTS	0
Res...	0
Vent...	0
OPOT	0
OPPT	0
OPSP	0
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Conn...	0

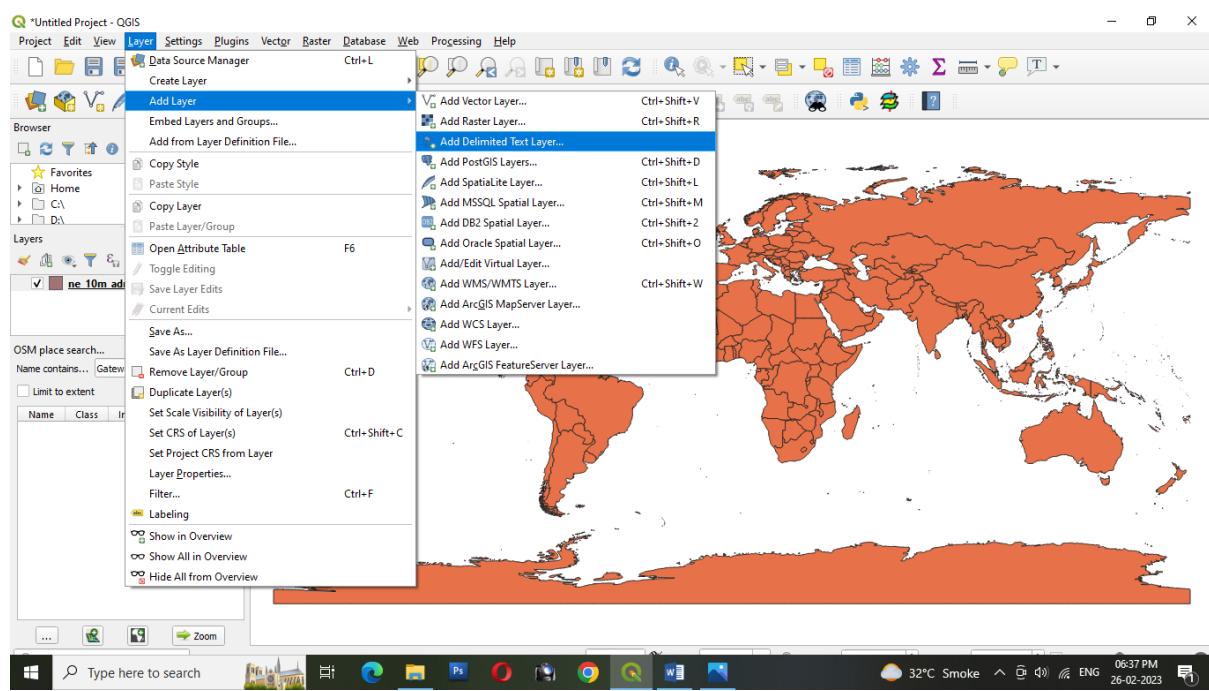
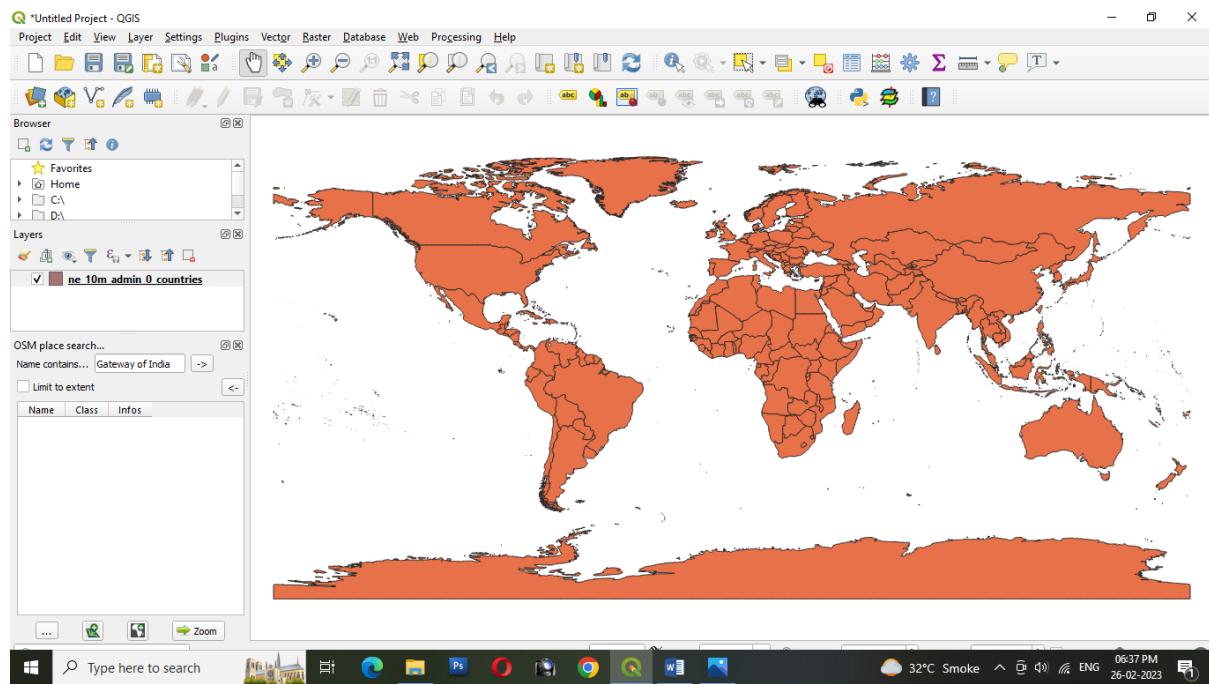
Mode Current layer Auto open form

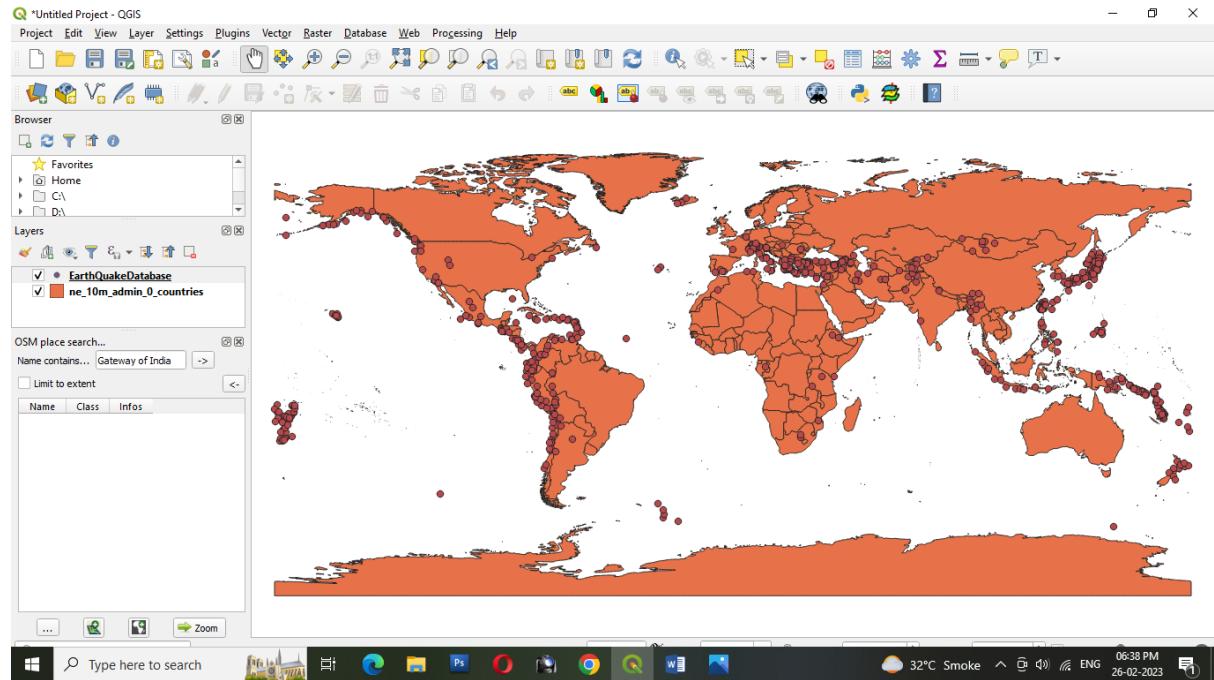
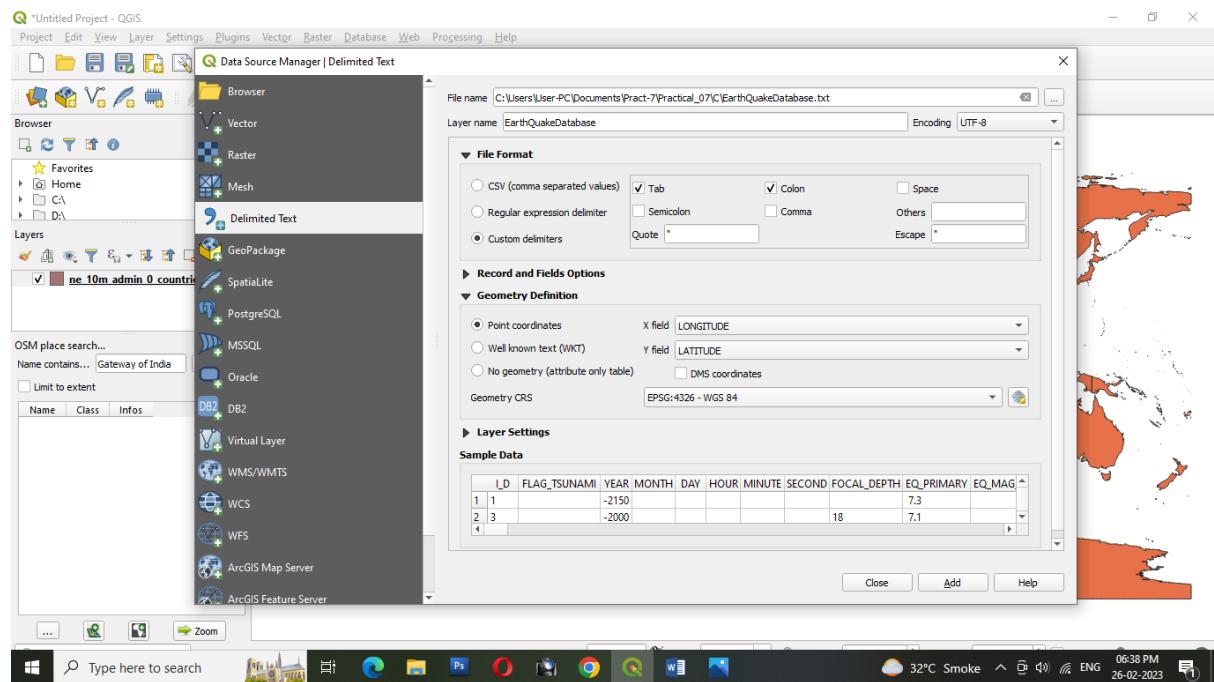
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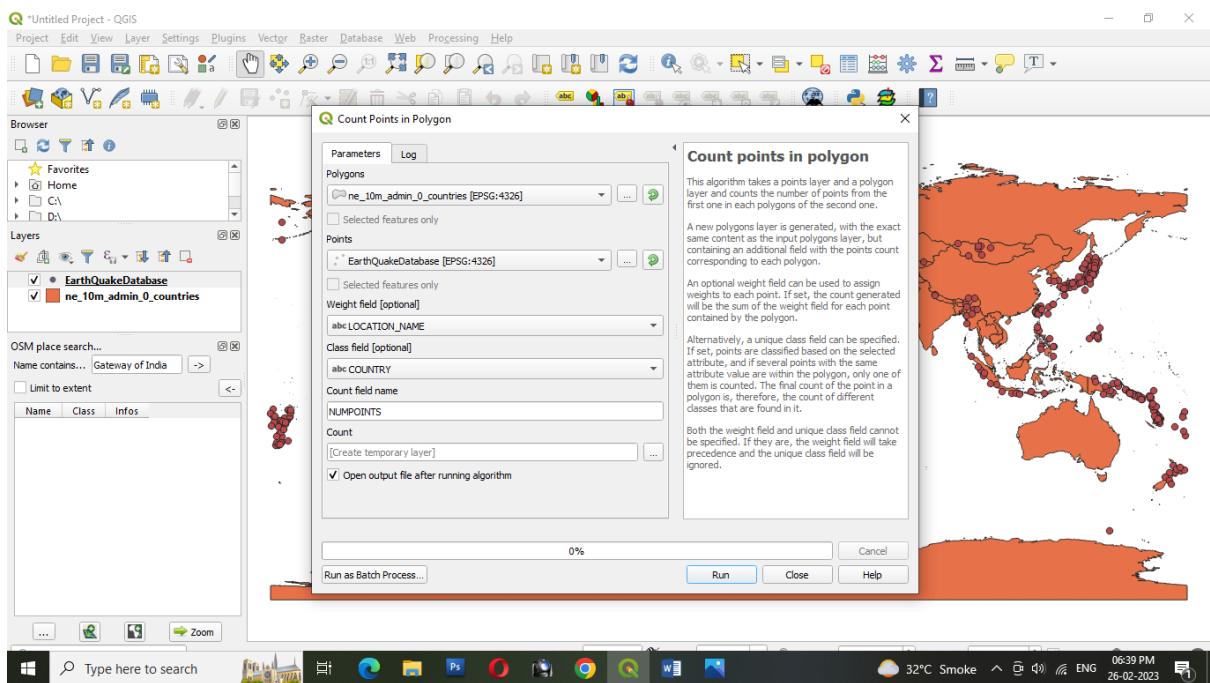
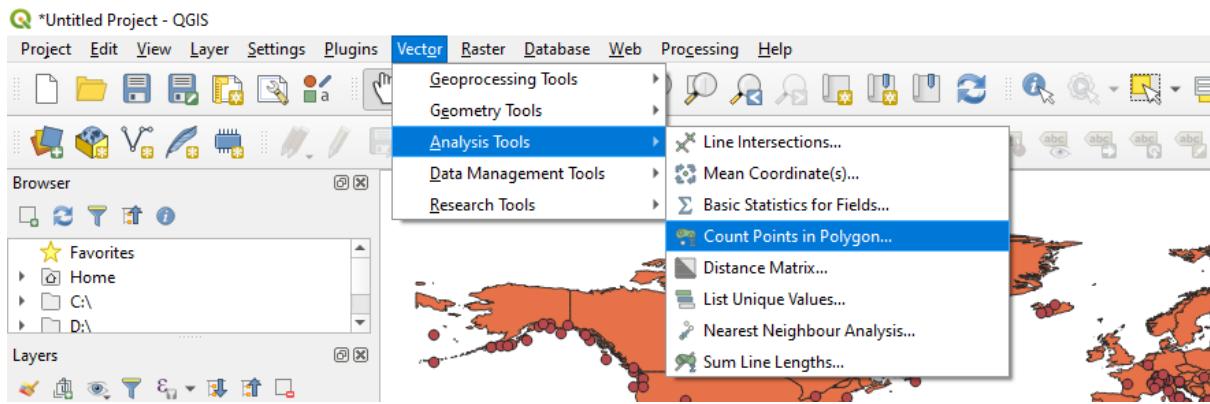
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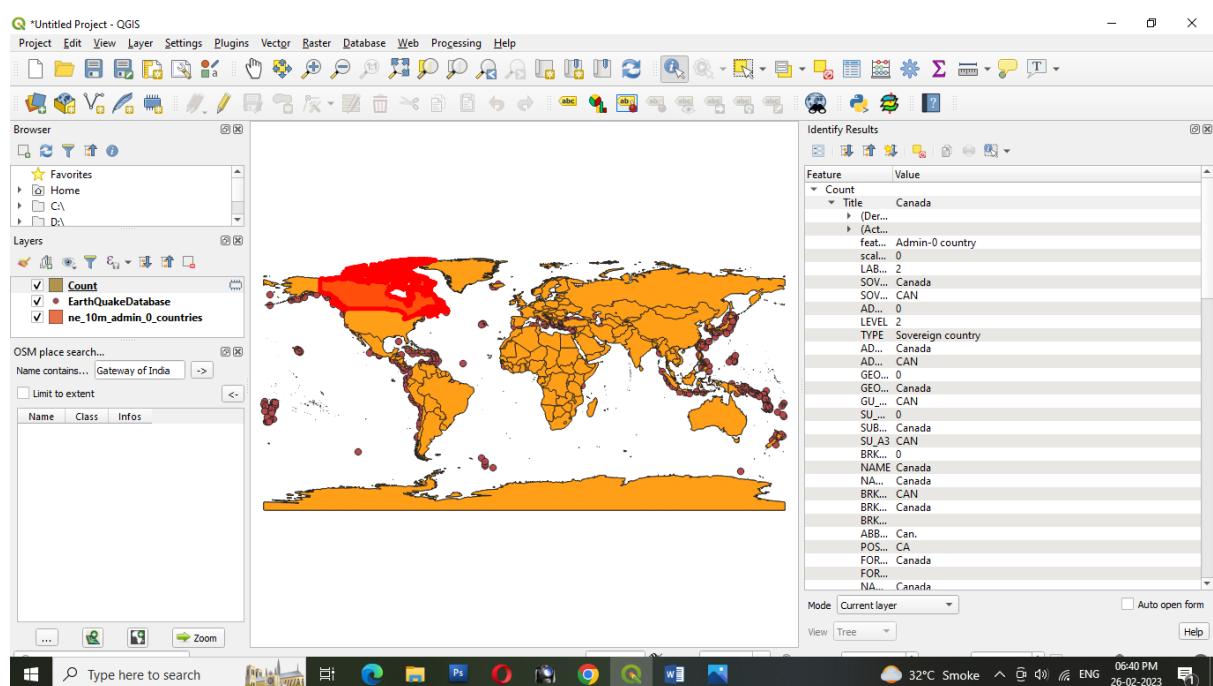
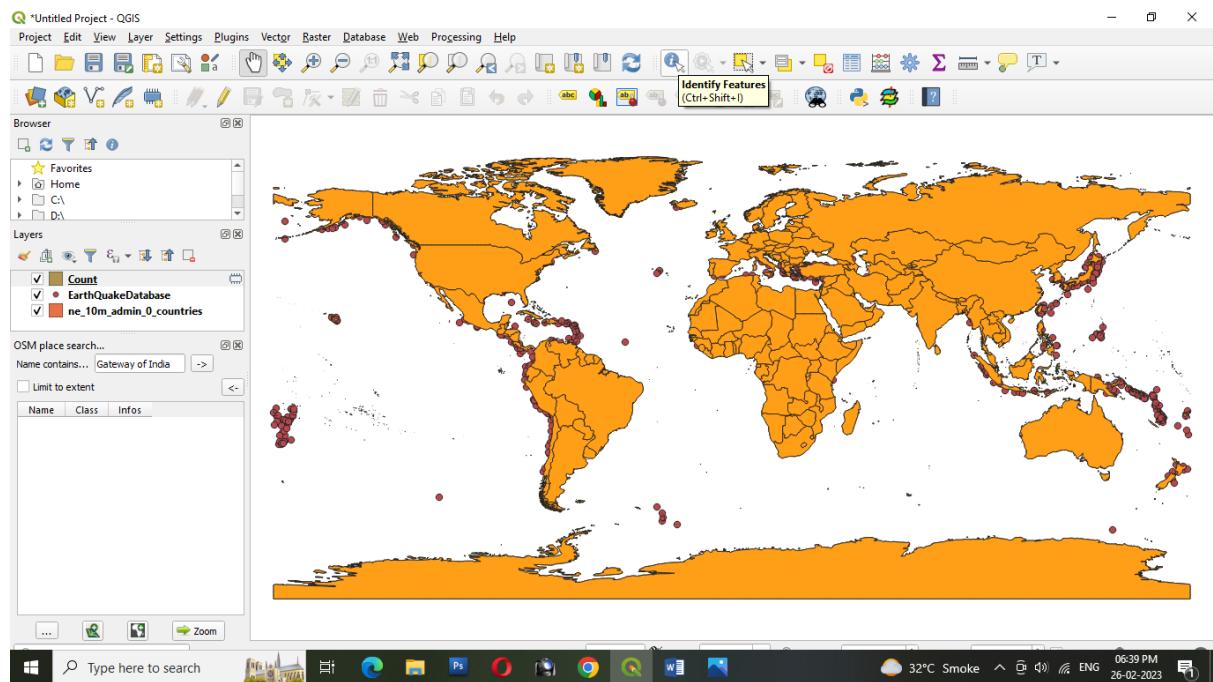
6(C) Counting points in polygon-polygon analysis



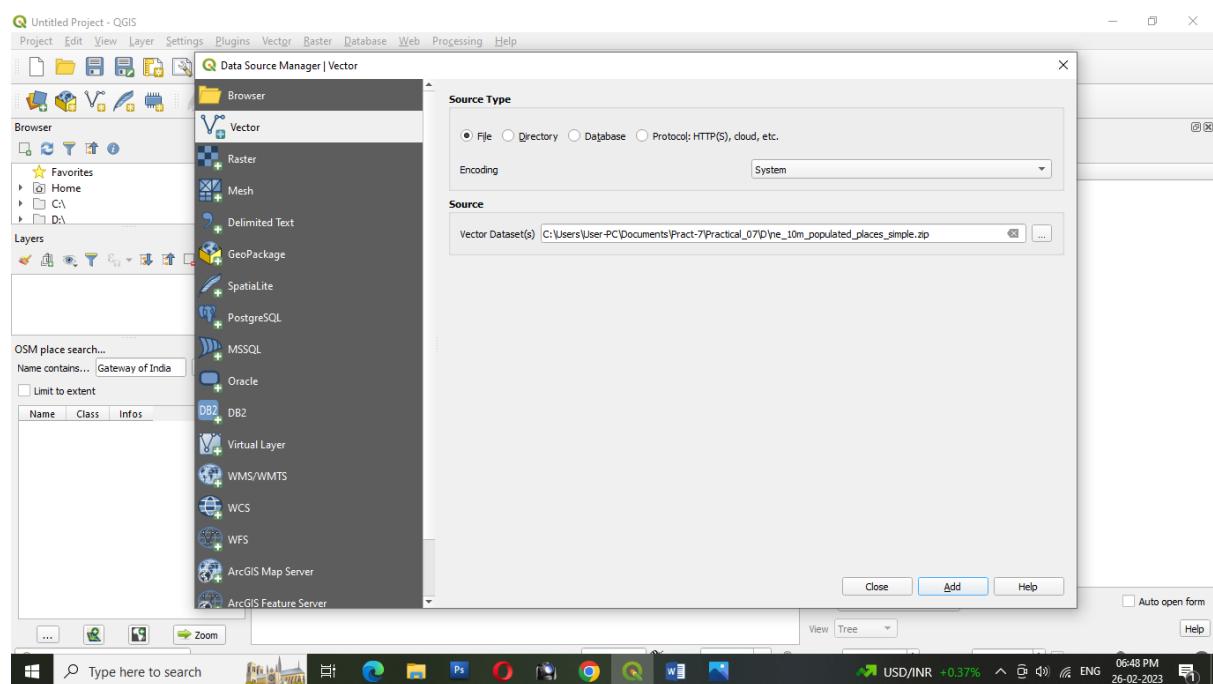
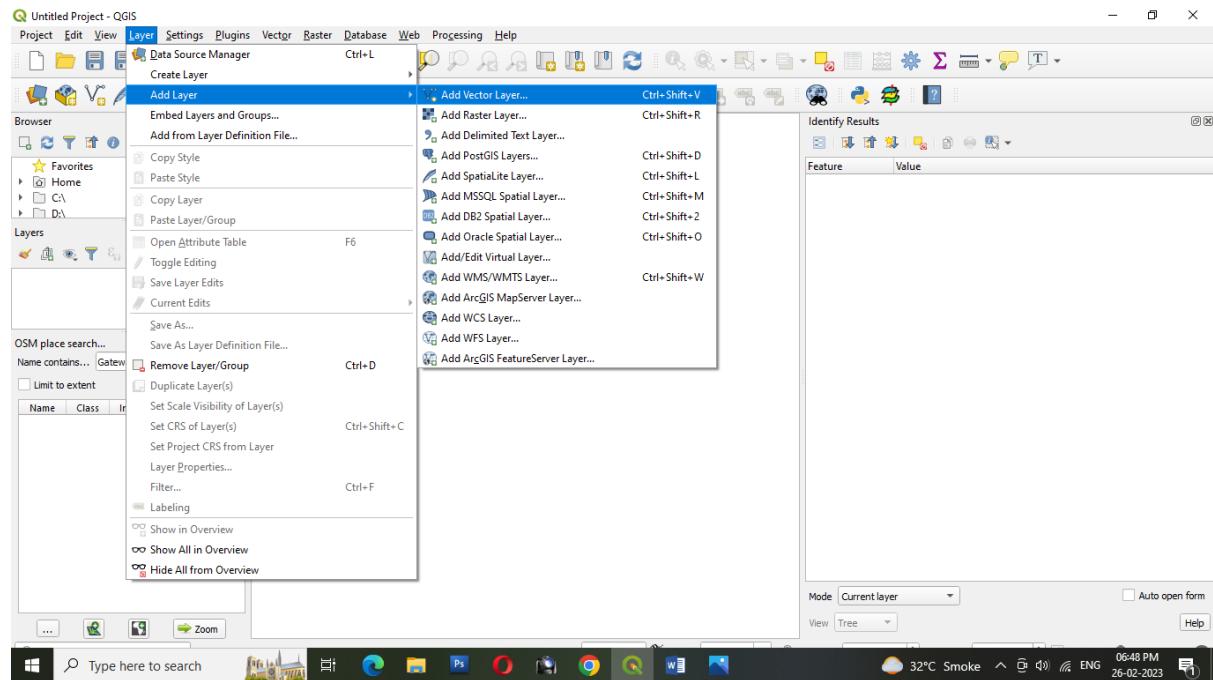


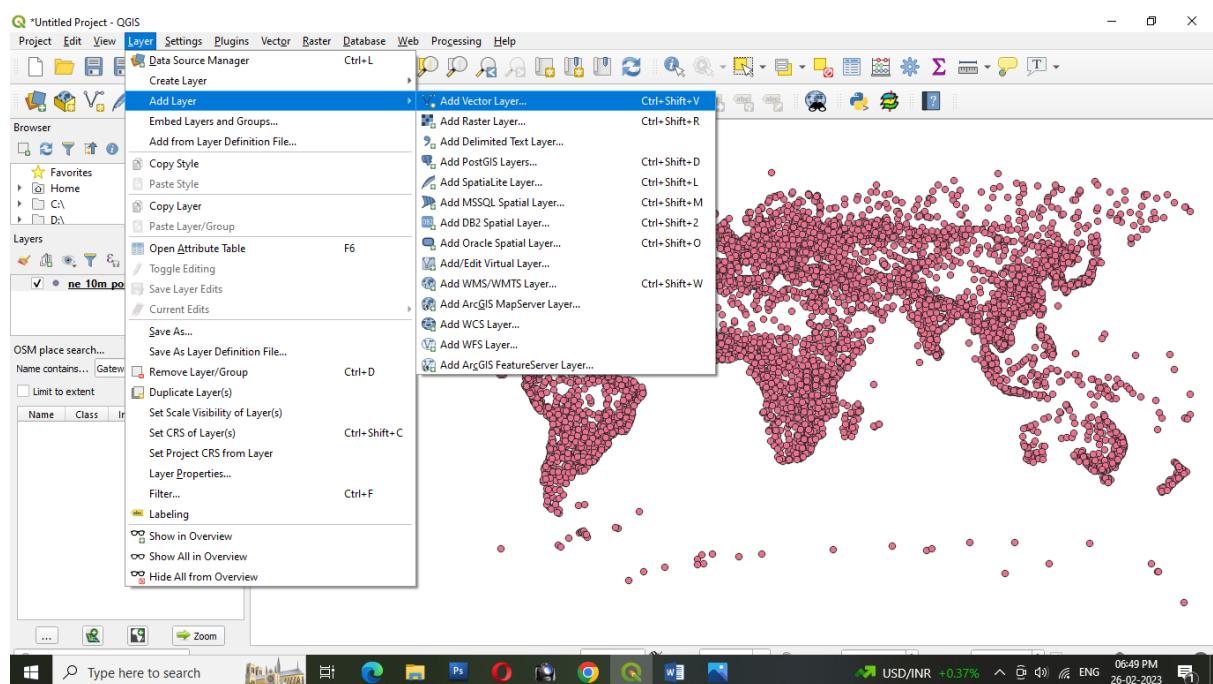
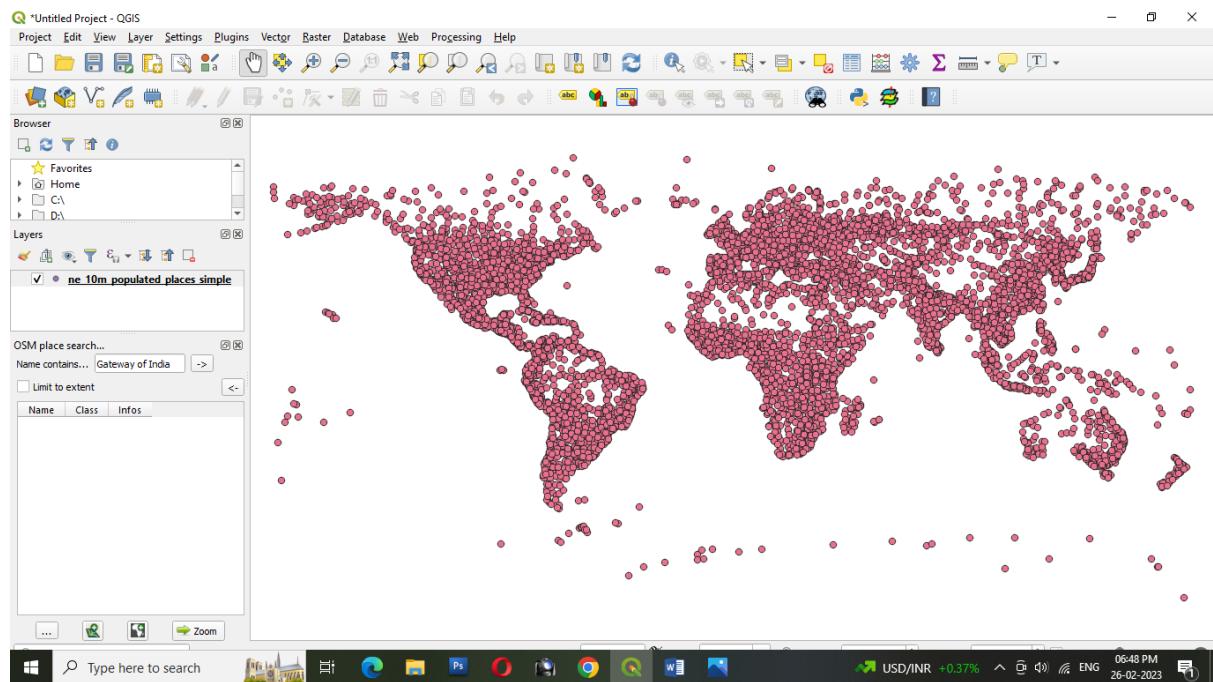


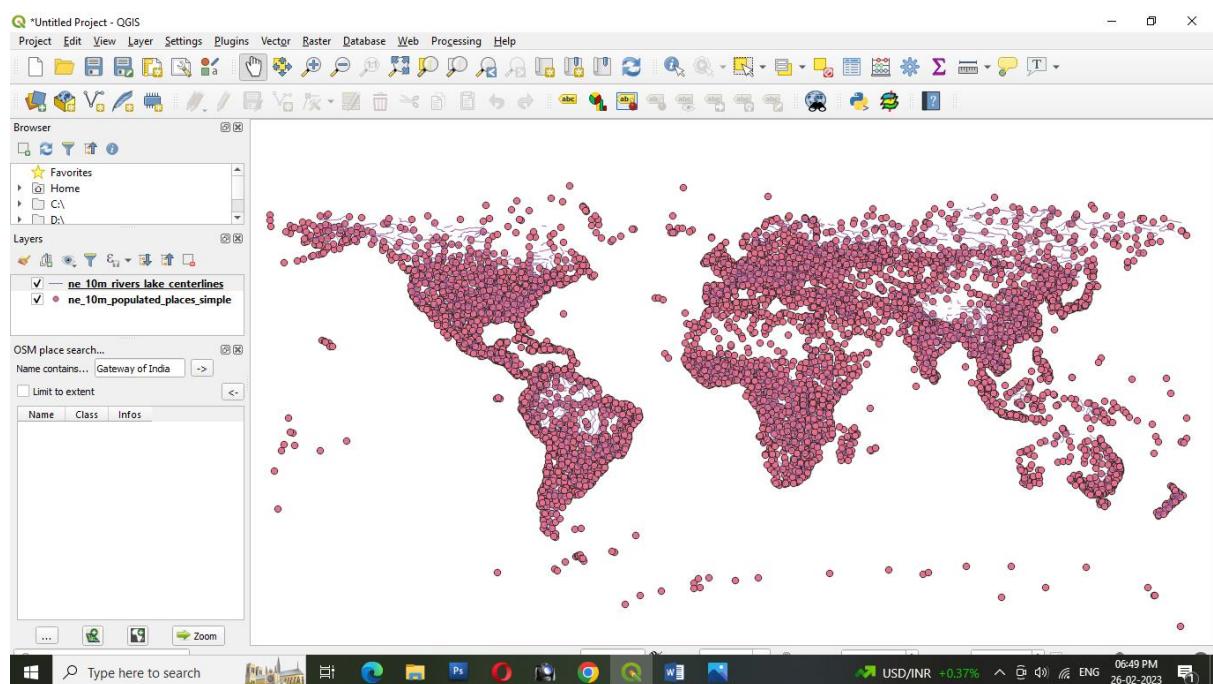
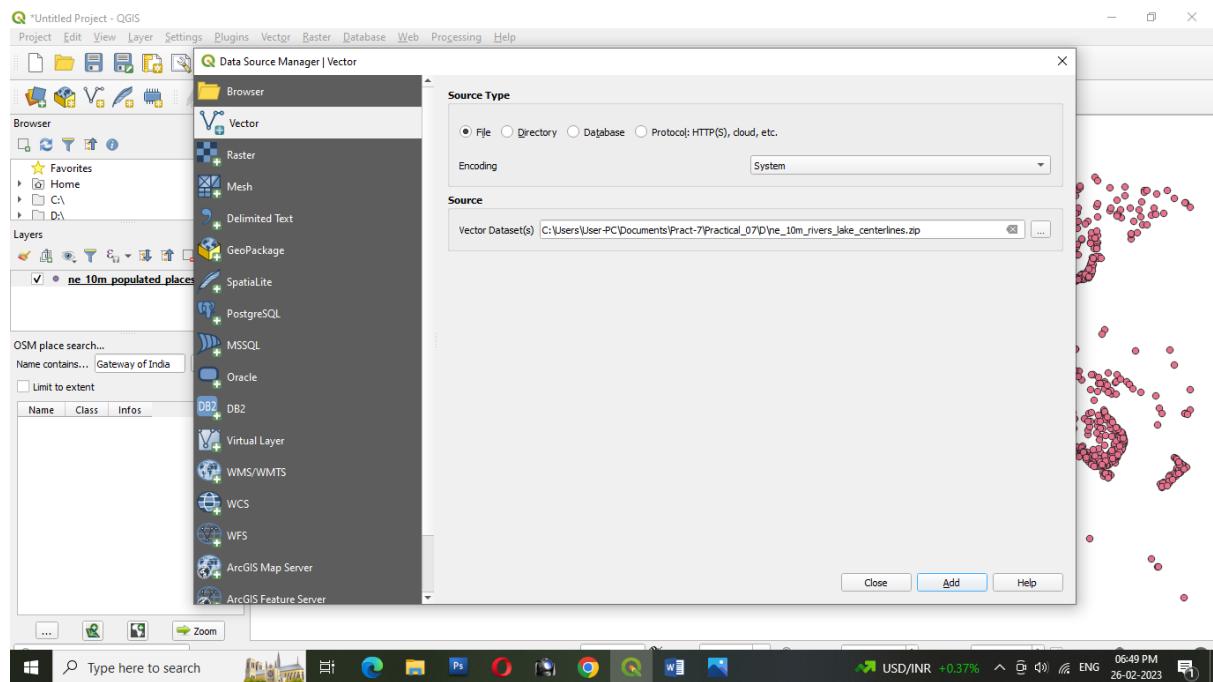


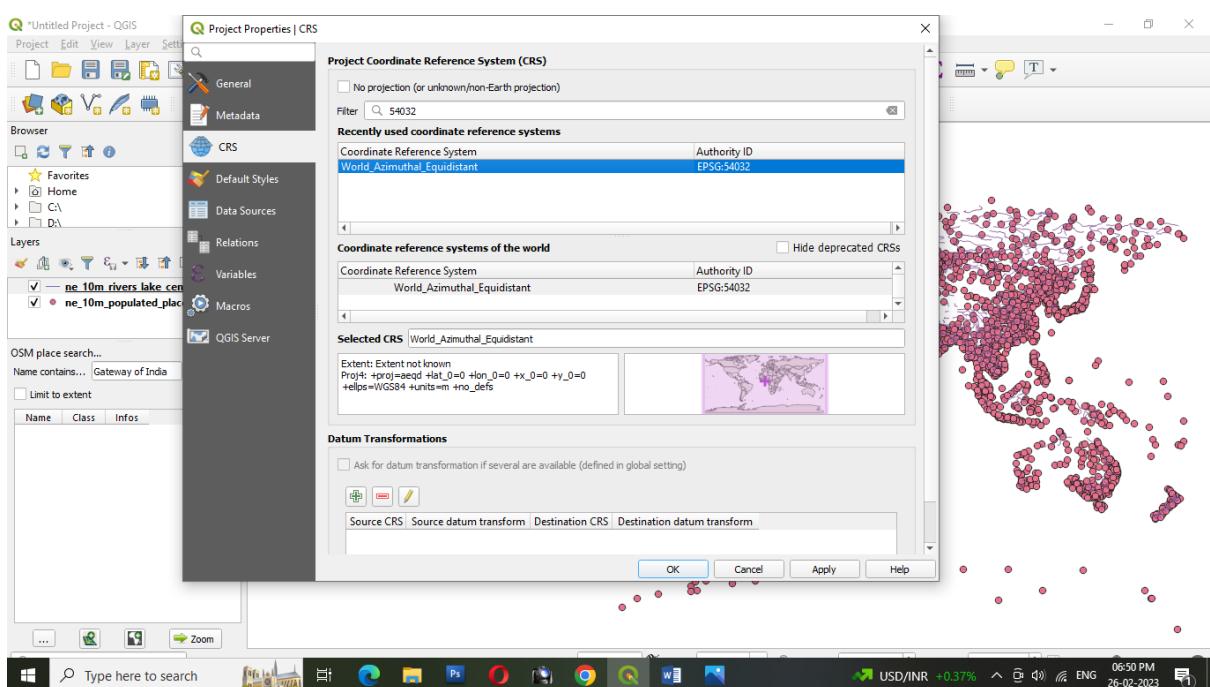
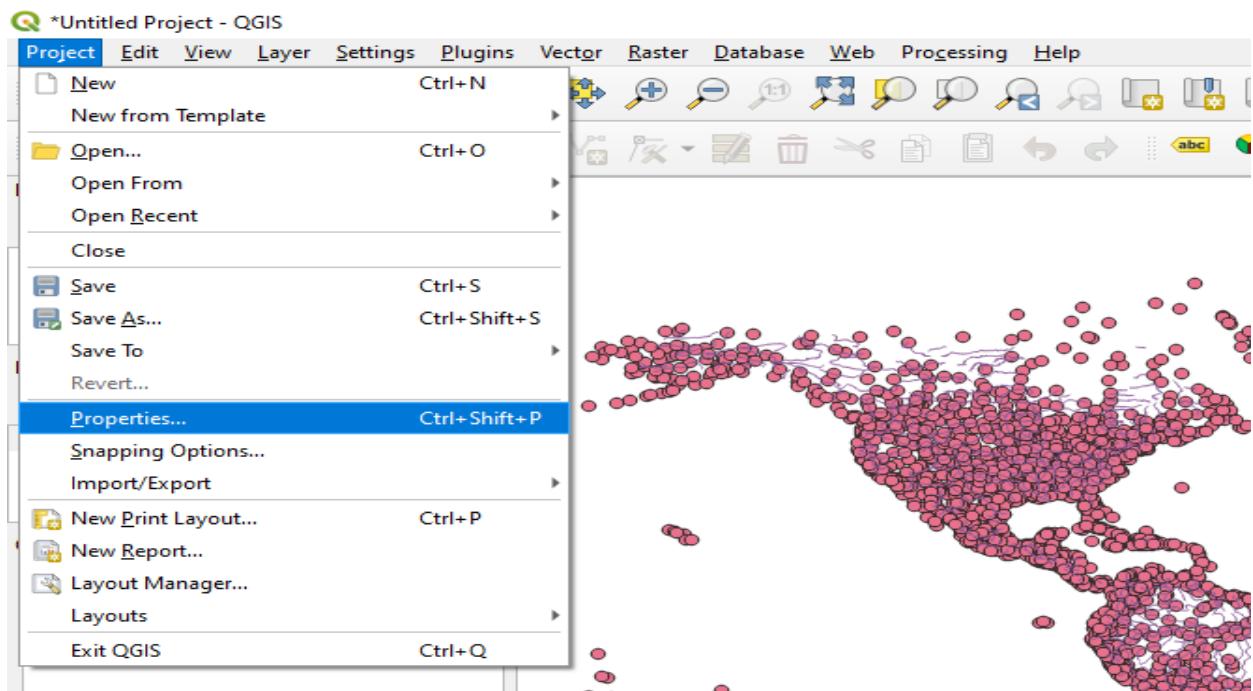


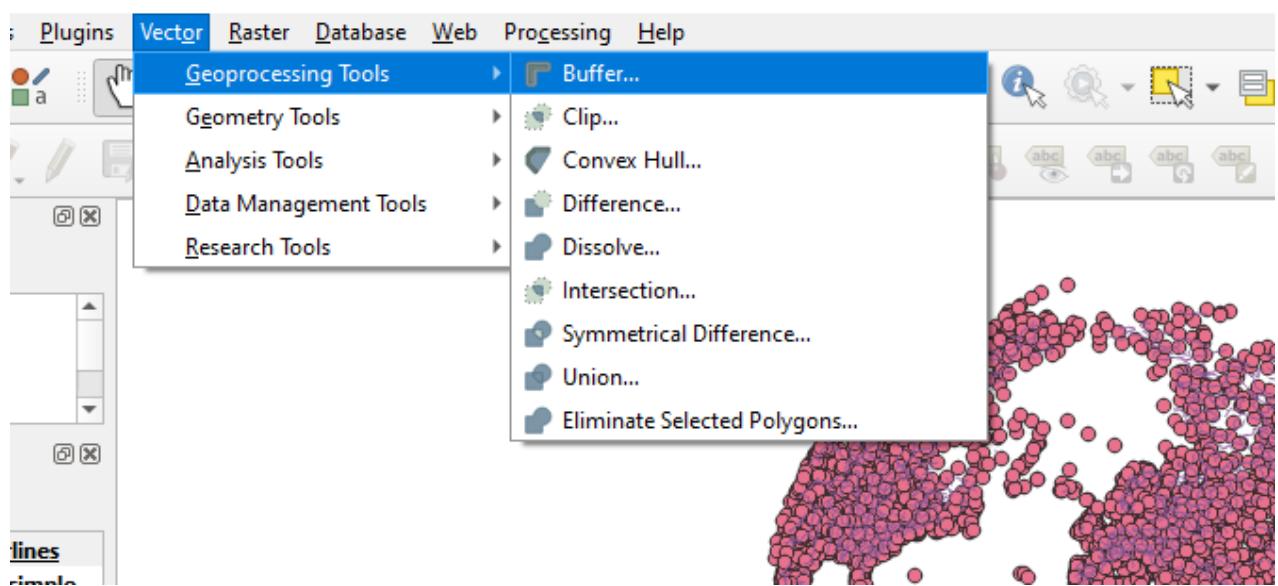
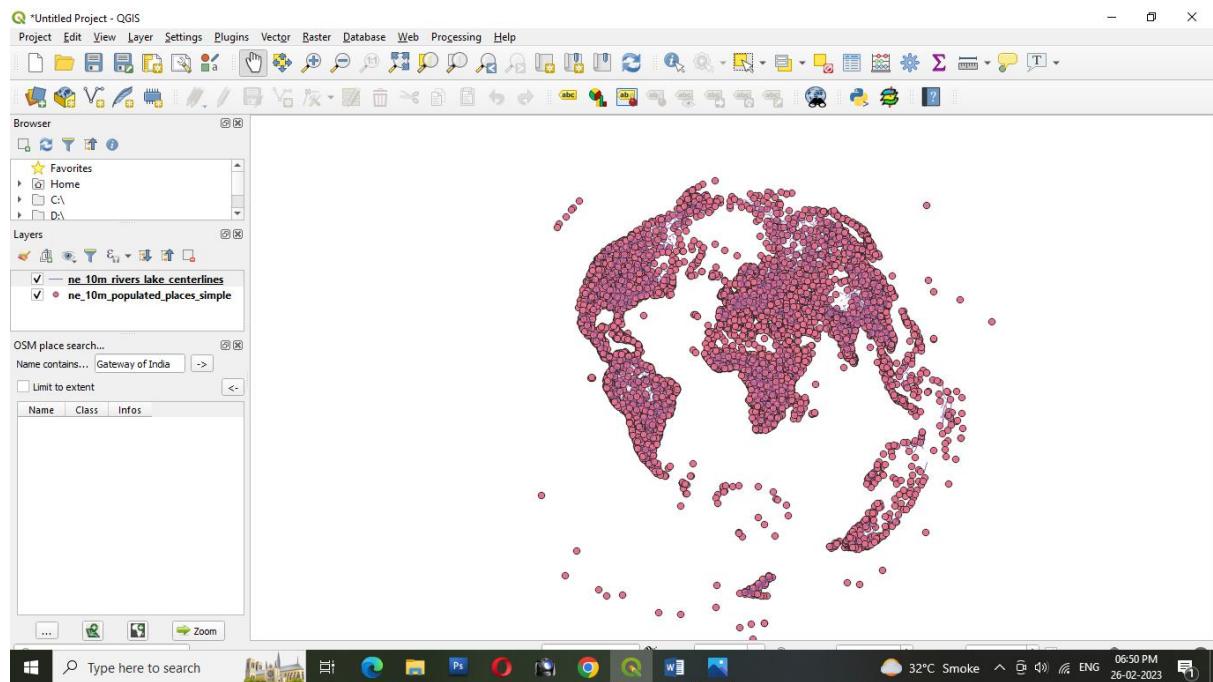
6(D) Buffer around Rivers- Spatial queries

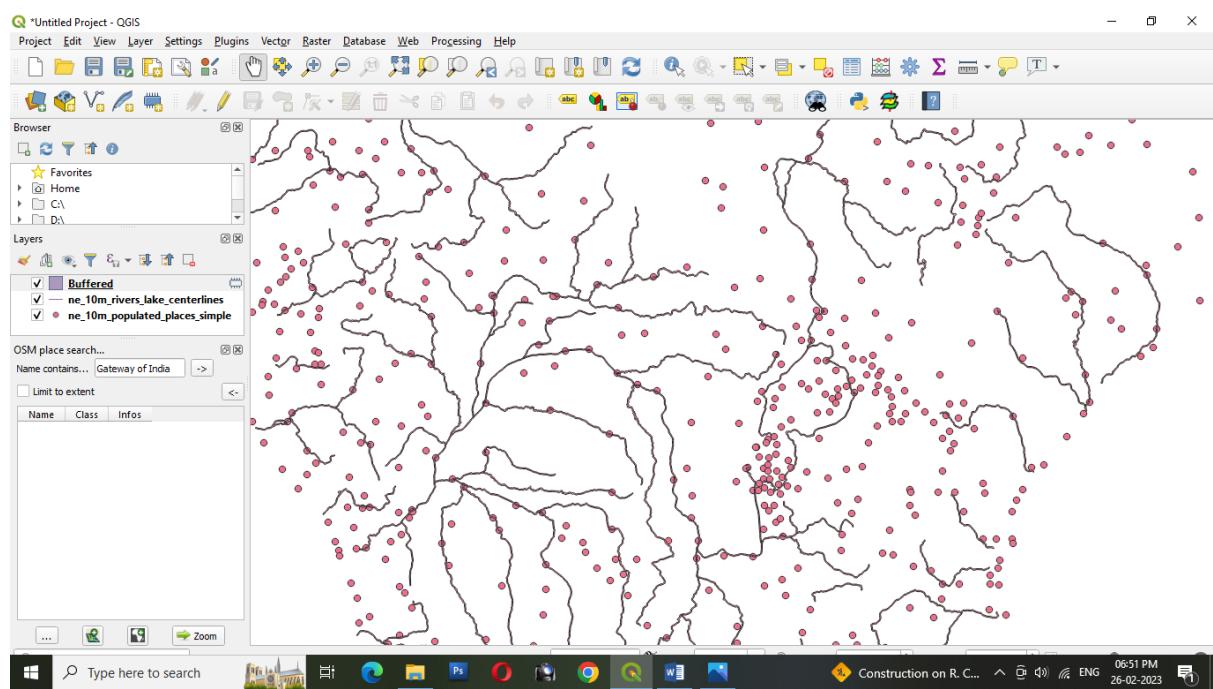
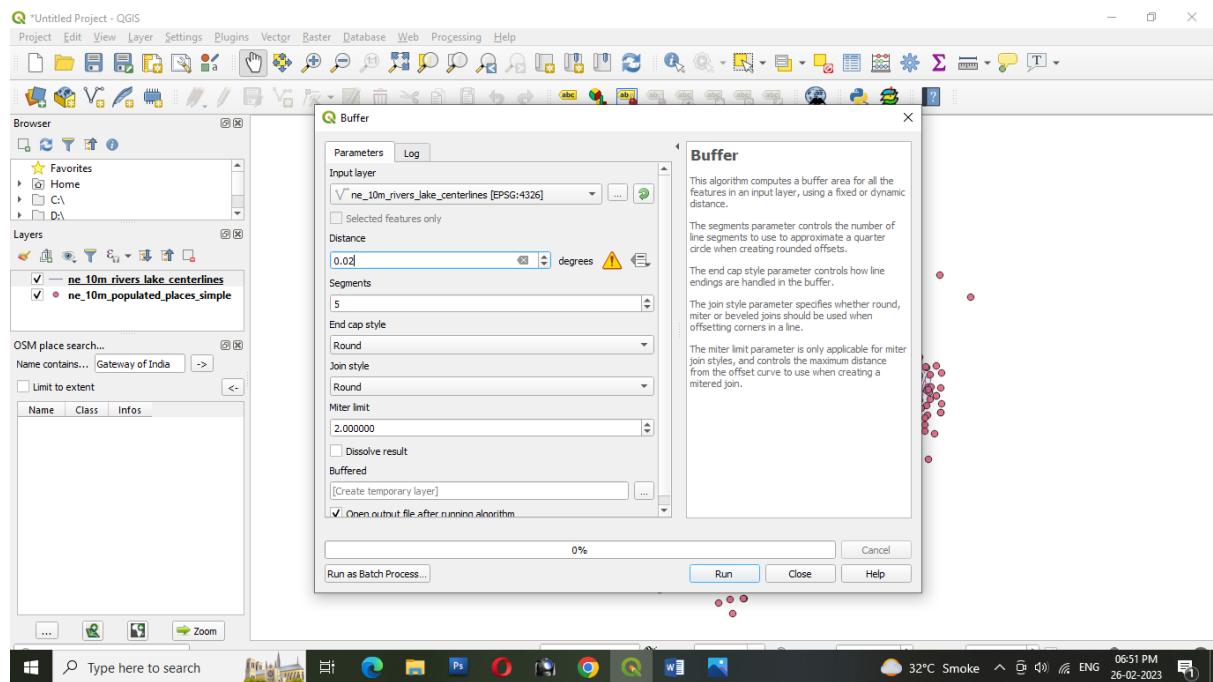


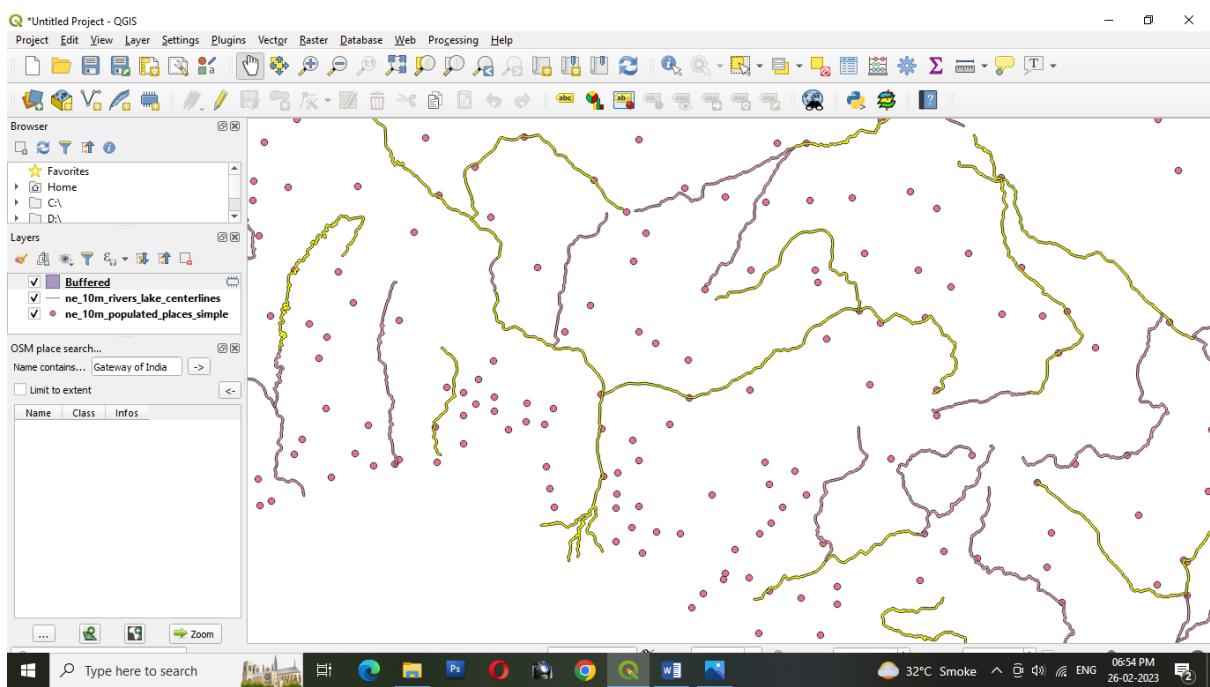
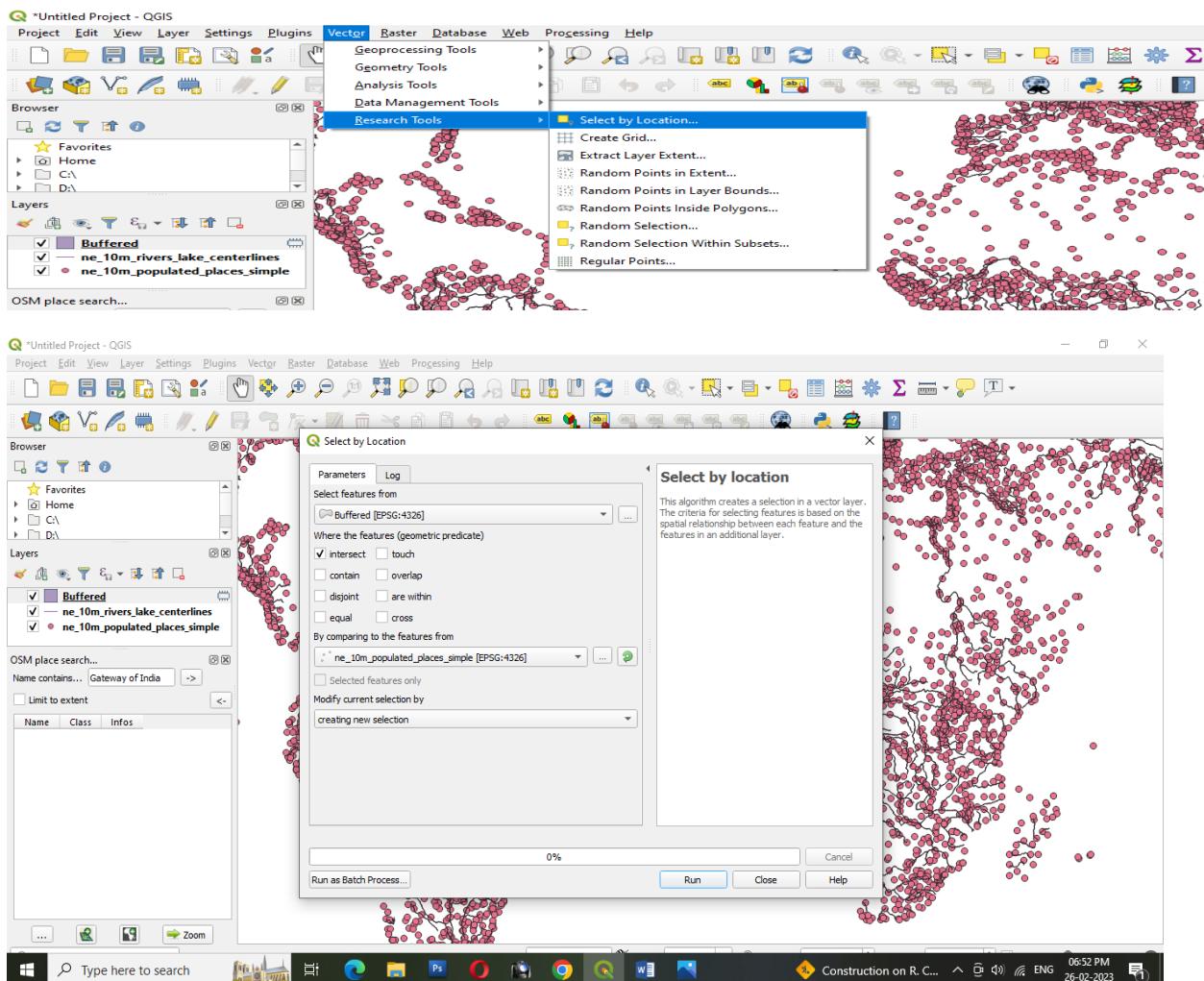






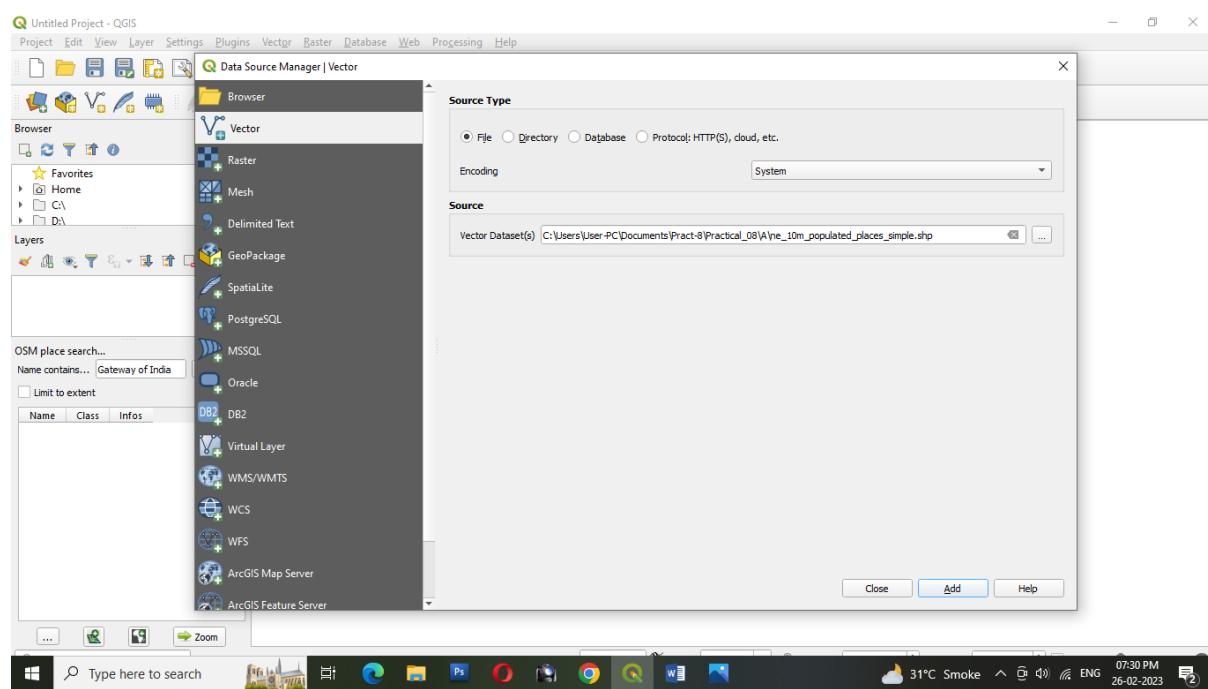
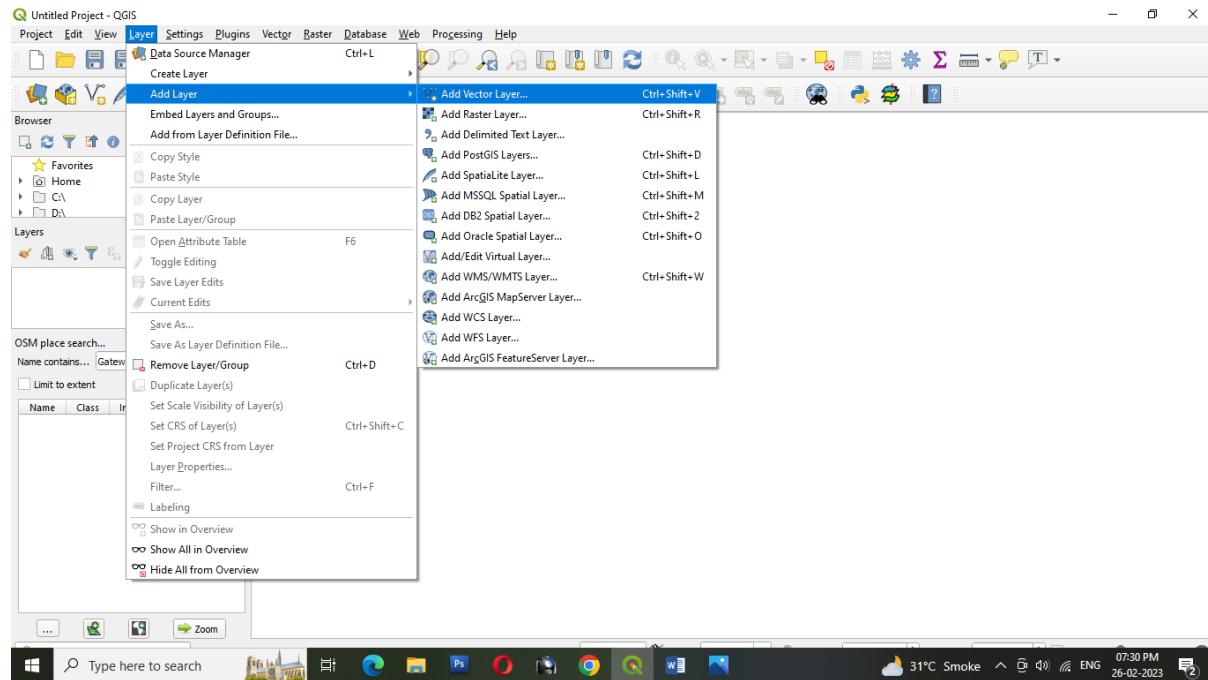


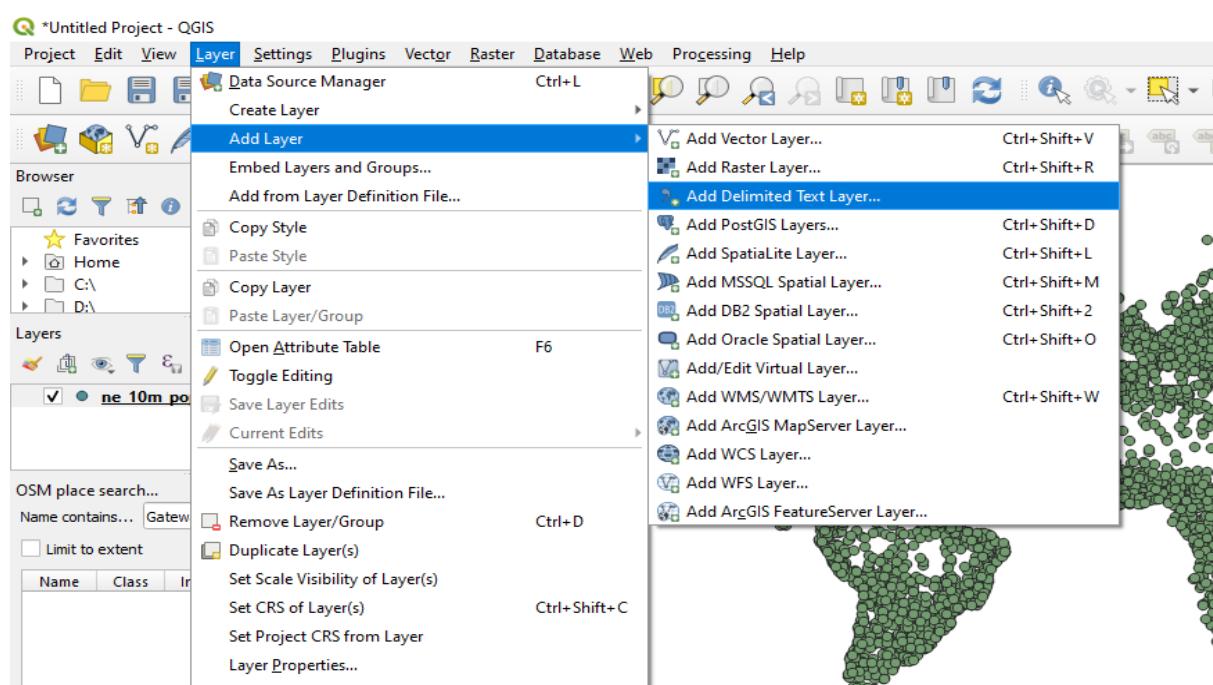
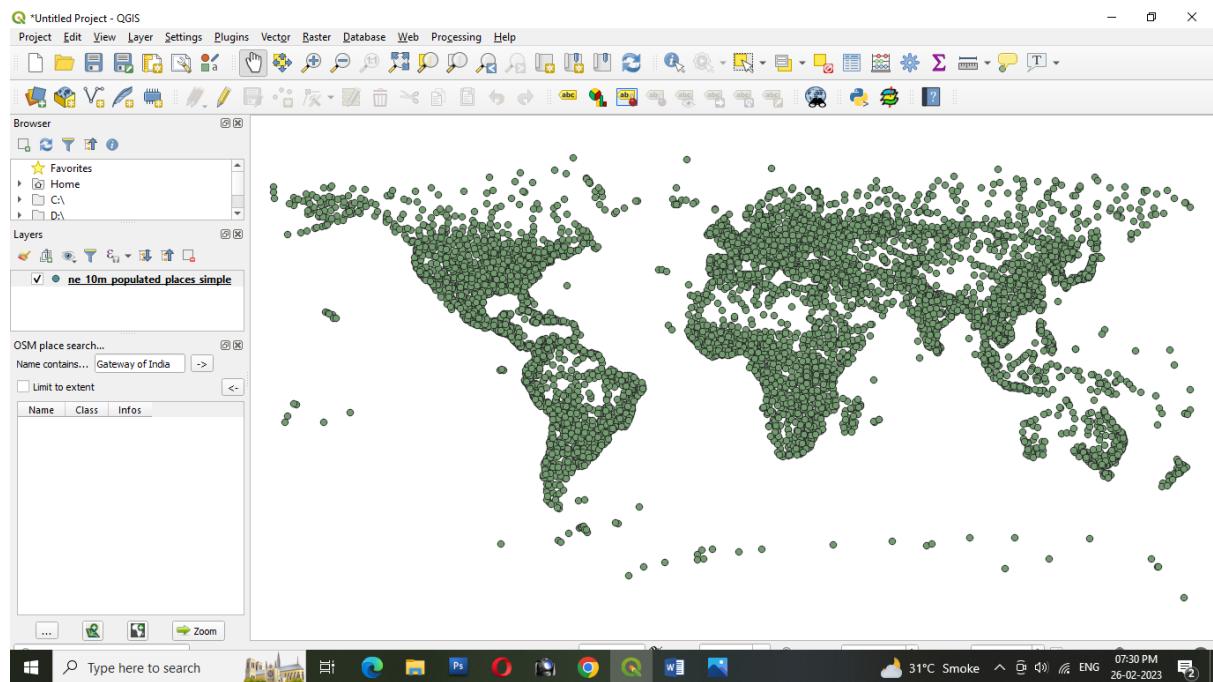


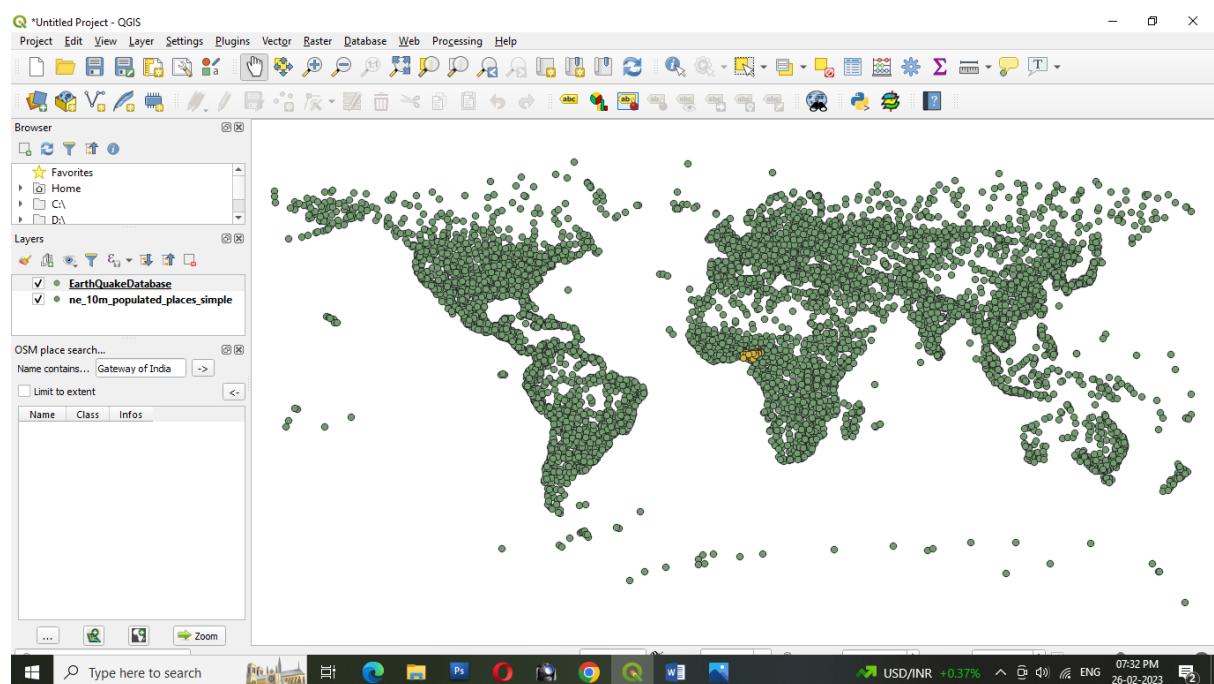
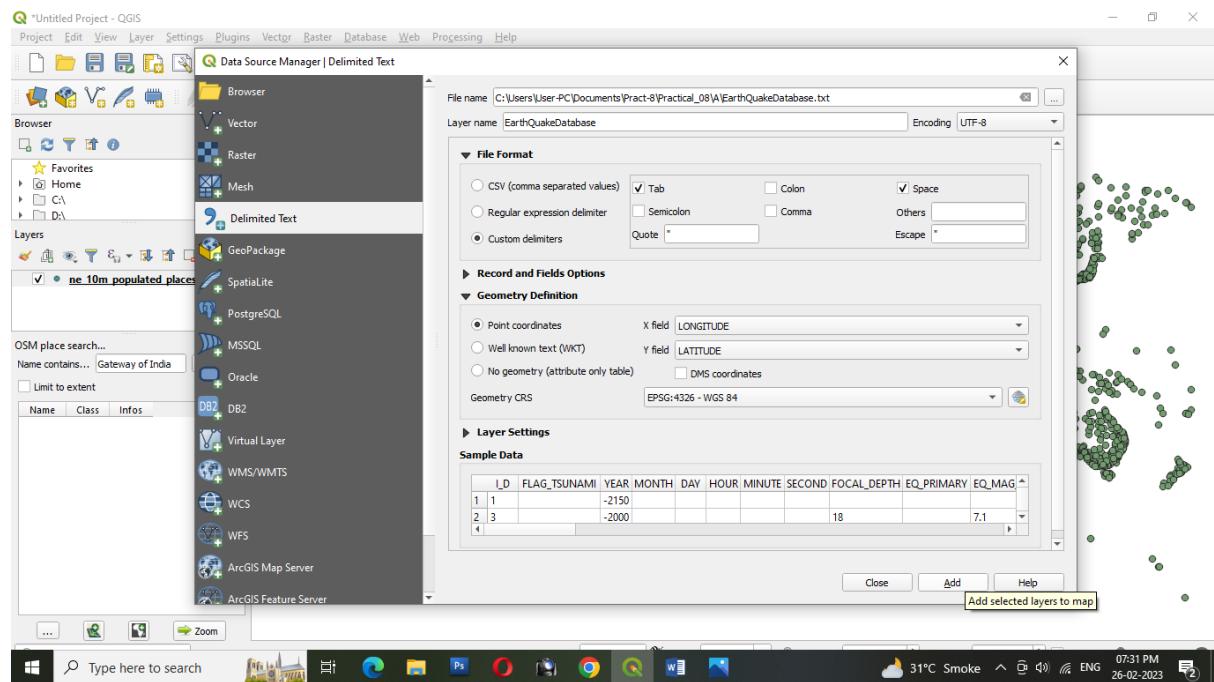


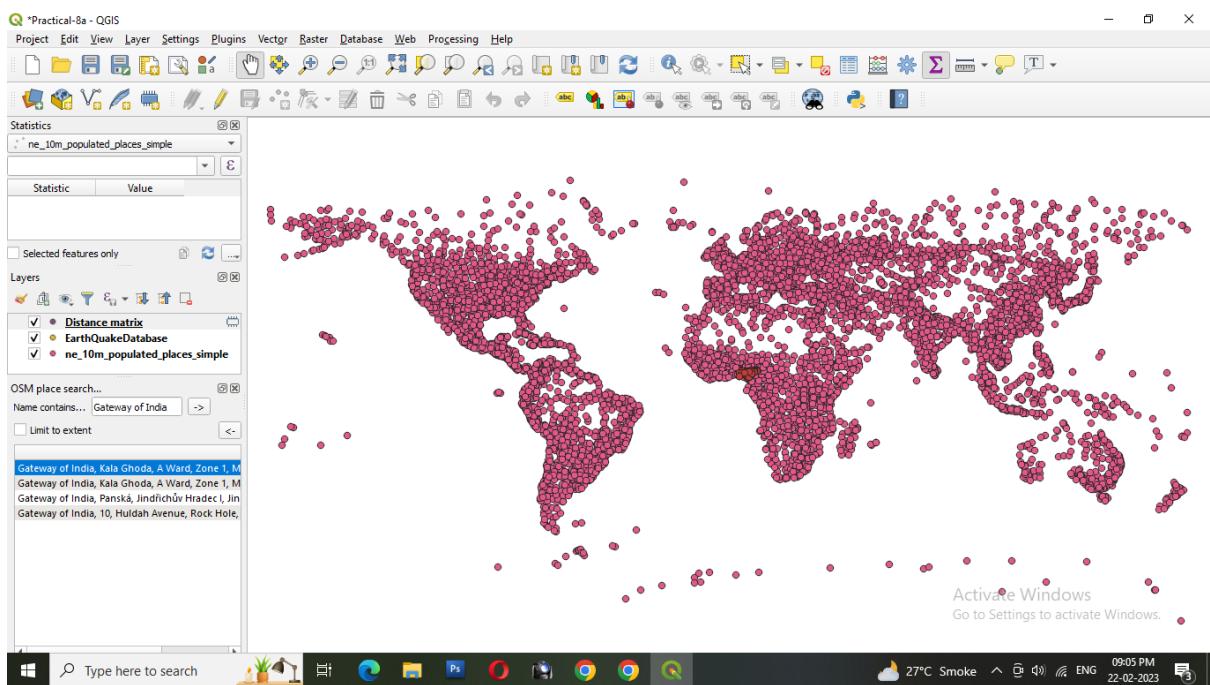
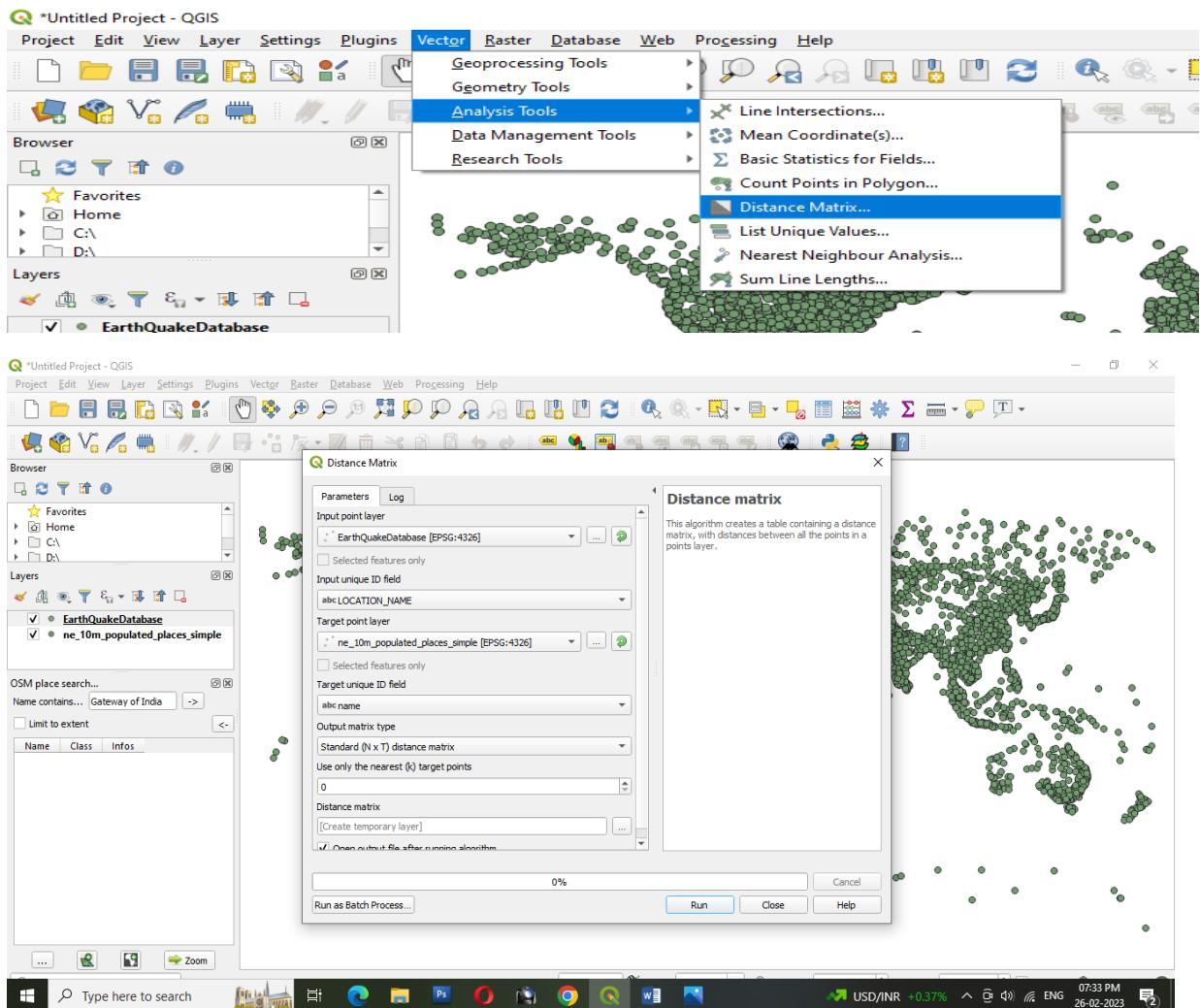
Practical 7: ADVANCED GIS OPERATIONS 1

7(A) Nearest Neighbour Analysis

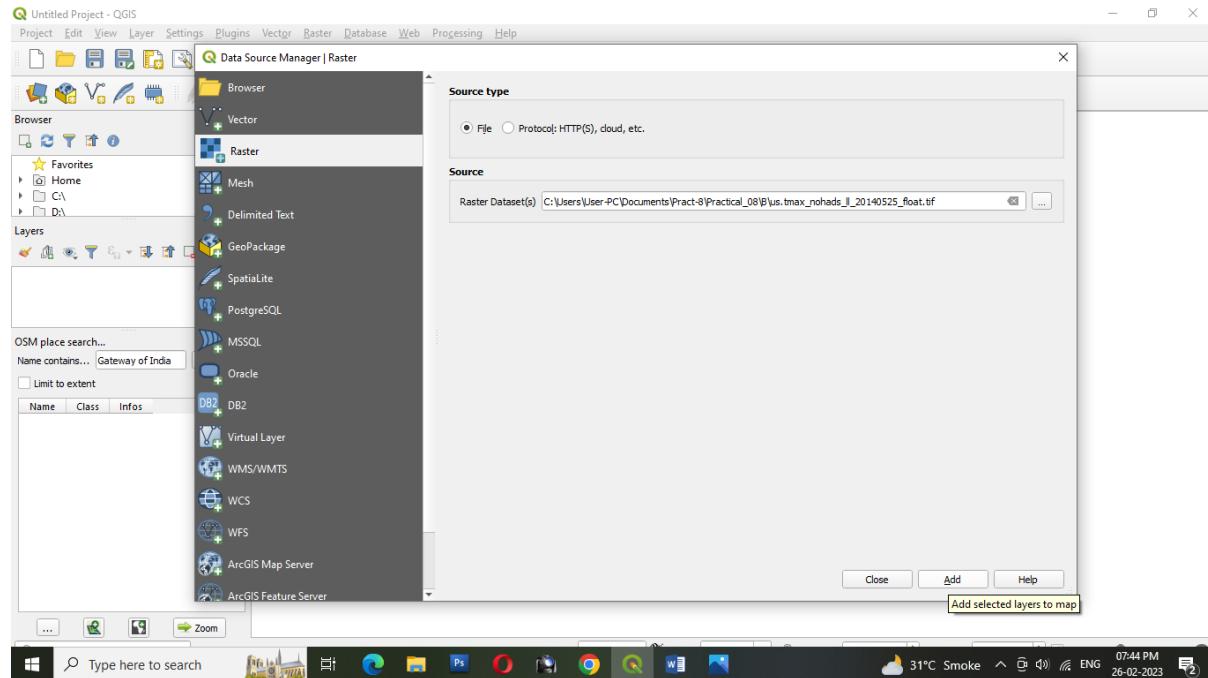
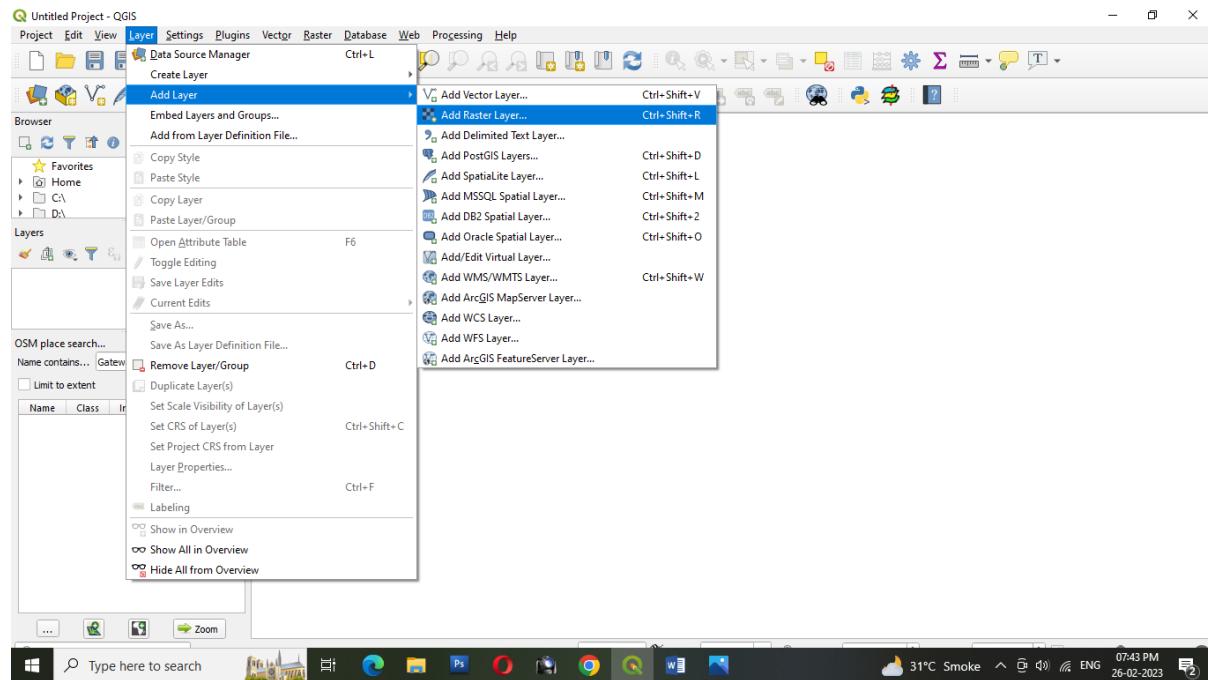


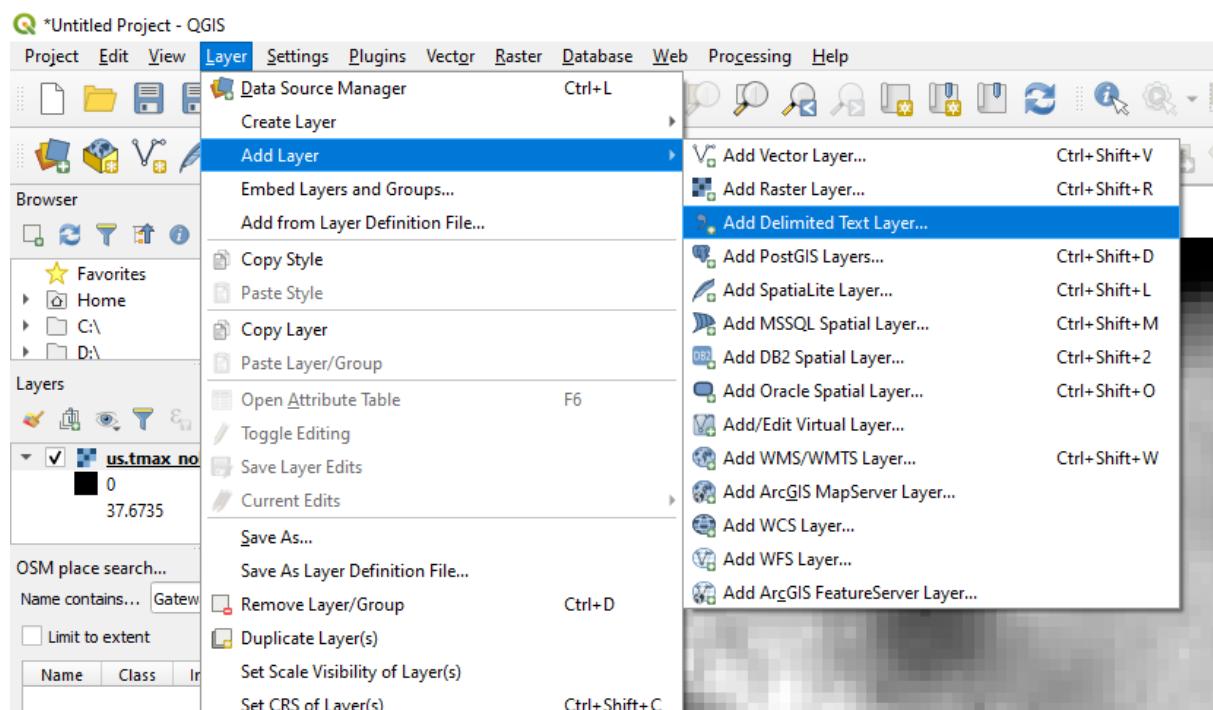
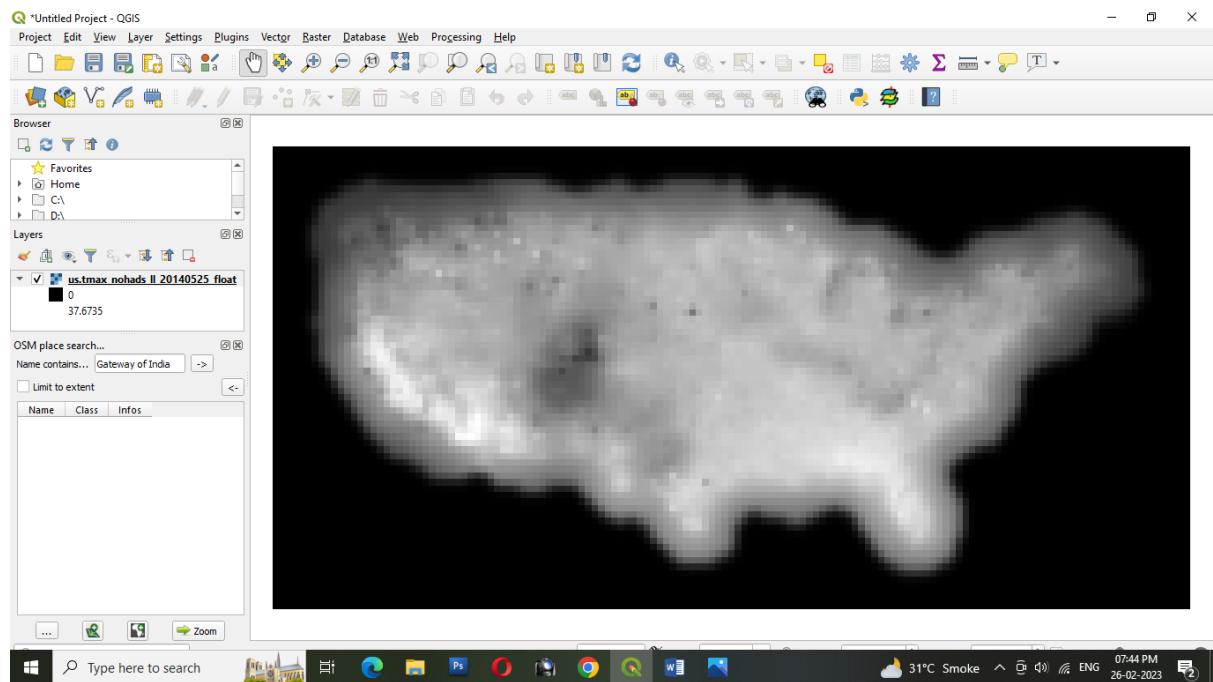


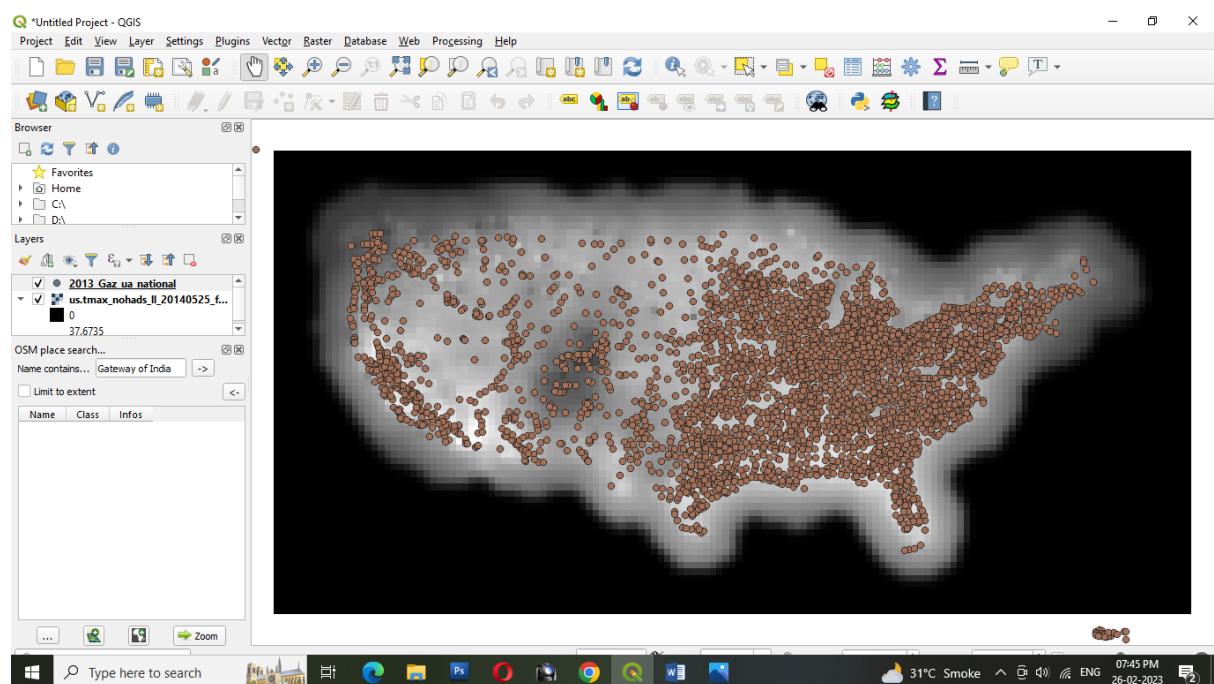
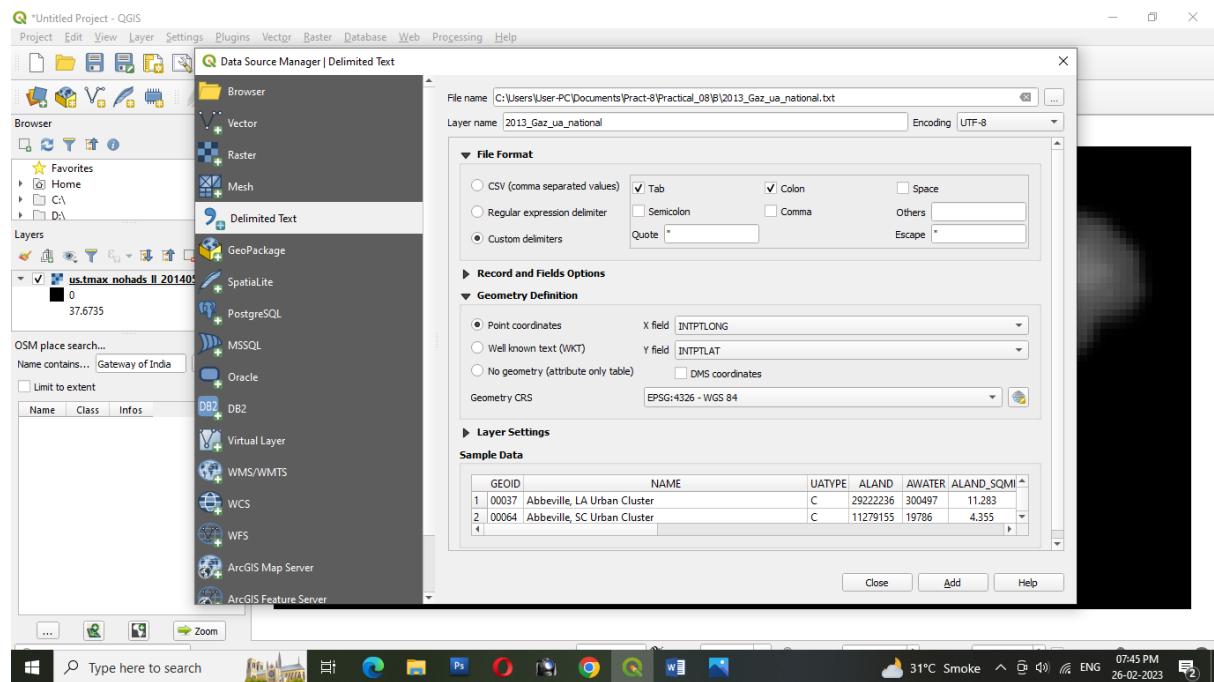


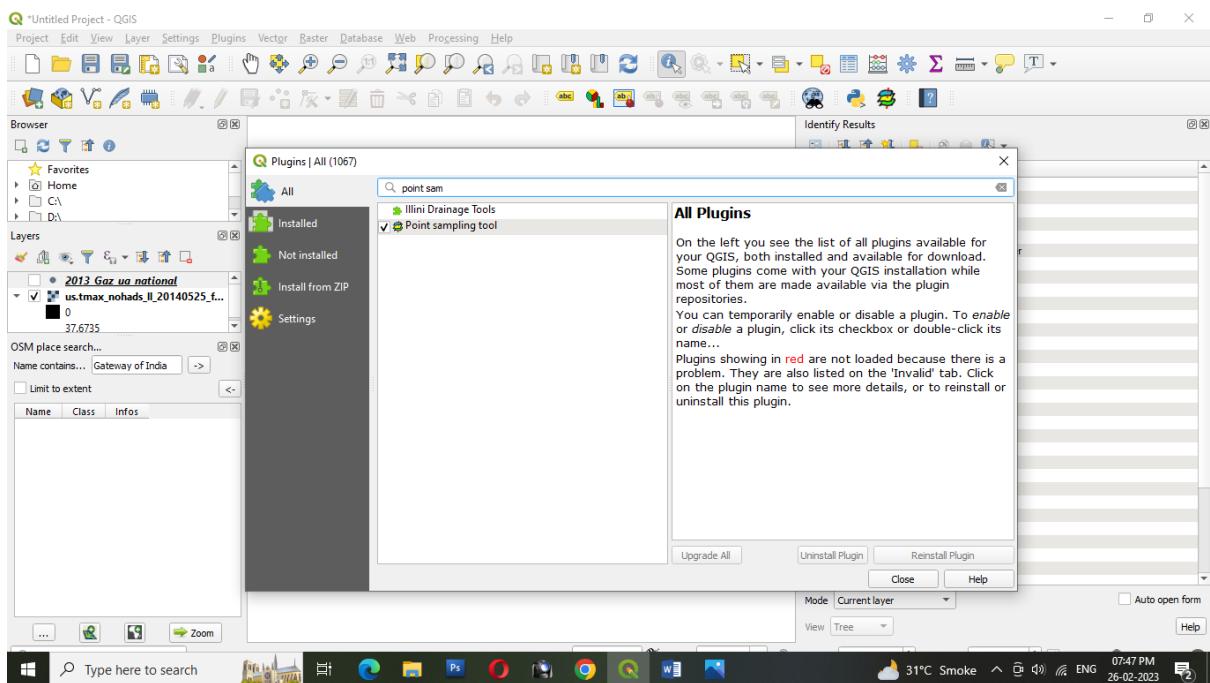
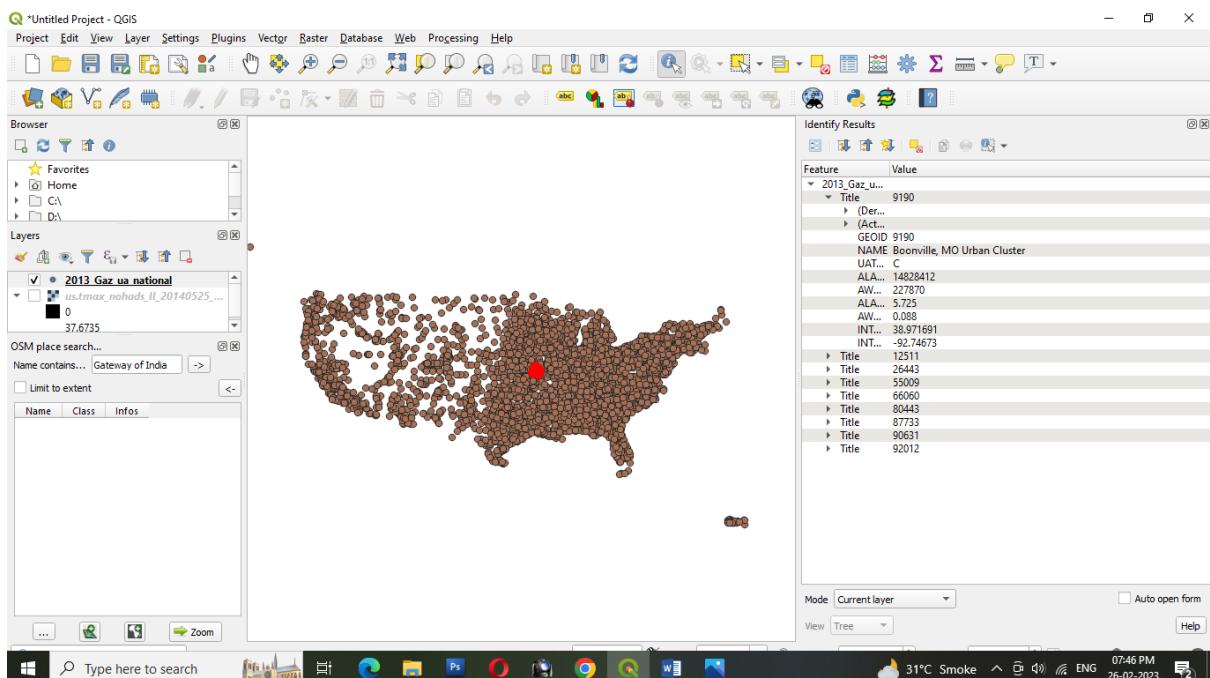


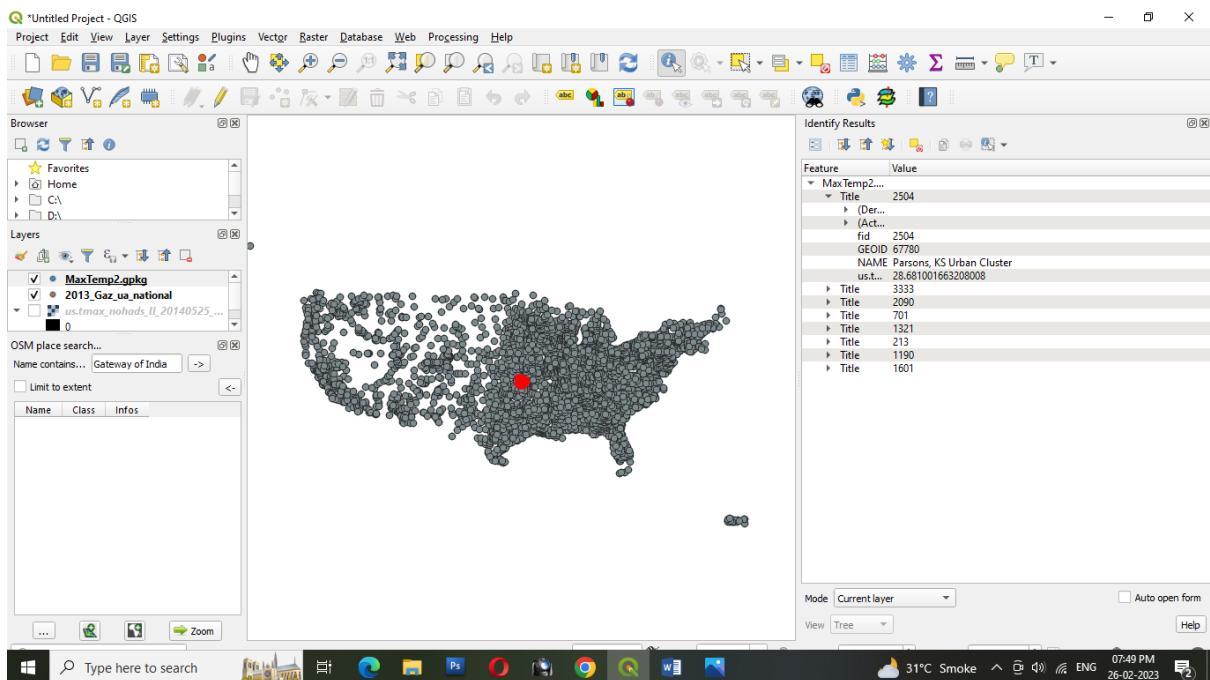
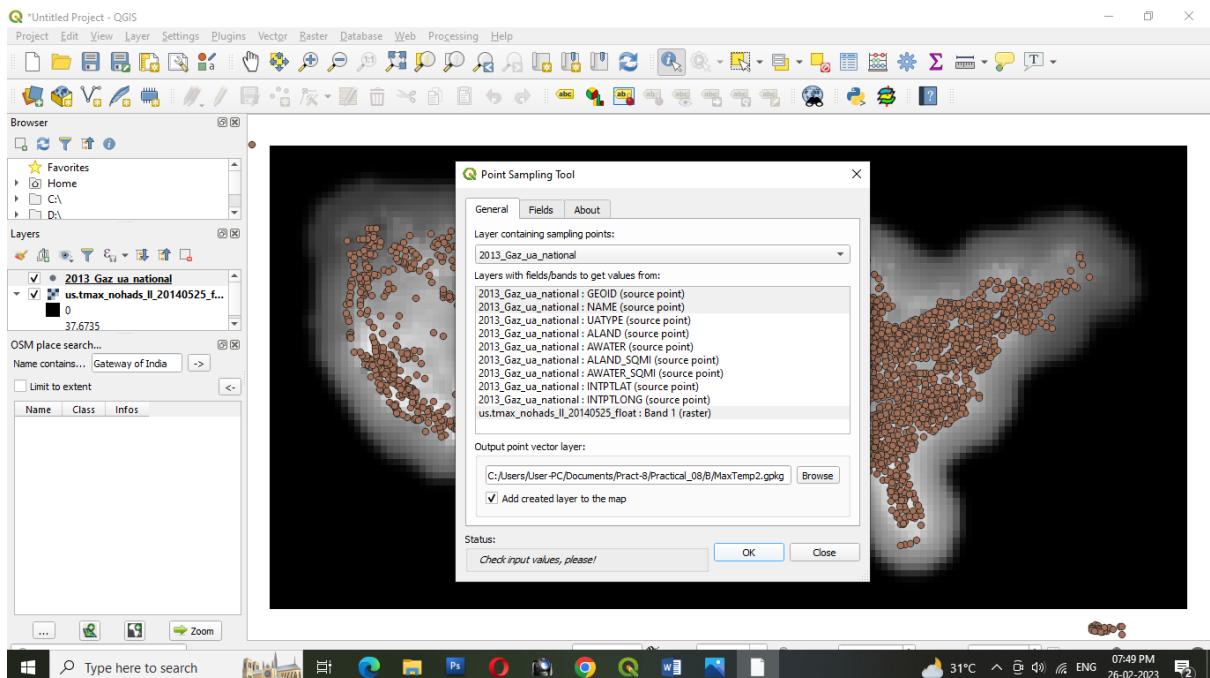
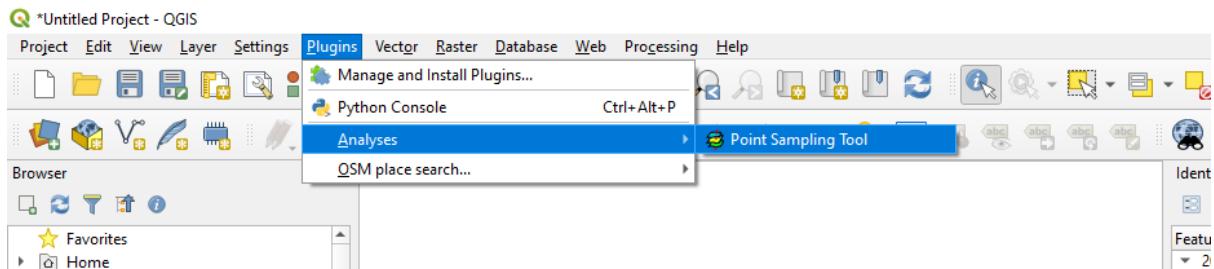
7(B) Sampling Raster data using Points or Polygons











Practical 8: ADVANCED GIS OPERATIONS 2

8(A) Batch Processing – Processing Framework

